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Address in Pathology
ON
CHEMOTHERAPEUTICS:
SCIENTIFIC PRINCIPLES, METHODS, AND RESULTS.

Delivered before the Seventeenth International Congress of Medicine

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MR. PRESIDENT, LADIES AND GENTLEMEN,—It must be a great pleasure and a special honour for all of us to meet here personally on British soil for a scientific purpose, in order to take part in the great work which will be of benefit to the whole world.

THE POSITION OF ENGLAND IN THE FIGHT AGAINST INFECTIOUS DISEASE.

Are we not here in a country that has produced two men who must be considered among the greatest men of all times—Jenner and Lord Lister? Like a star in the darkness of his age Jenner's great achievement, which broke the power of such an awful public plague as small-pox, still shines with peerless splendour. And on the occasion of the last Congress which was held here we gathered with wondering admiration round Lord Lister, who through his introduction of antiseptics brought about a revolution in surgery which stands alone in the history of medicine. Here in England the first example of a modern Institute for Tropical Diseases, which is a model for all other institutes of this kind, was created under the direction of Sir Patrick Manson. Through Ross's excellent work, Laveran's discovery of the causes of malaria was so far advanced that entirely new lines were opened up for the hygienic struggle against tropical and subtropical diseases.

The proof by Castellani that a trypanosome is the cause of sleeping sickness, the classical work by Bruce on illnesses caused through trypanosomes, the specific cause of kala-azar (Dum-Dum sickness), as proved by Leishman, are all well known to us. The therapeutic influence of atoxyl in the cases of trypanosome diseases was first established in the Liverpool Tropical Institute by Thomas and Breinl, and quite recently Plimmer has brought forward the use of tartar emetic as an effective weapon against protozoal diseases.

The lifework of Almroth Wright is also known to all of us—i.e., his work on opsonins and on the prophylactic treatment of typhoid fever, which has been carried out in a practical and most excellent manner. Even these few names, to which I might add many others, show what a high and leading position England has taken, and still holds, in the fight against infectious diseases. To prevent the spread of, and to heal, infectious diseases was at all times the highest aim of medical aspirations; however, a systematic pursuit of this purpose has only been possible in recent times, as through the labours of all civilised nations we have got an insight into the nature of infections, the causes of diseases, and the means by which they are transmitted. Through these methods it has been possible to infect animals artificially, and so obtain material on which to test the drugs in a systematic and rational manner. From the very first beginnings of therapeutics chemotherapy has, indeed, been in existence, as all the remedies which we employ are chemicals; on the other hand, experimental chemotherapy could only develop in modern times in a fruitful manner as a result of all this pioneer work. A special kind of institute, well equipped with chemical apparatus, is necessary for this purpose. The first institute of this kind was founded in Frankfurt through the munificence of Georg and Franziska Speyer.

THE PRINCIPLE OF FIXATION IN CHEMOTHERAPY.

Now, gentlemen, I may perhaps take the liberty of giving you an insight into the workshop of the chemotherapeutic work. The whole area is governed by a simple, I might even say natural, principle. If the law is true in chemistry that "Corpora non agunt nisi liquida," then for chemotherapy the principle is true that "Corpora non agunt nisi fixata." When applied to the special case in point this means that parasites are only killed by those materials to which they have a certain relationship, by means of which they are fixed by them. I call such substances "parasitotropic." But I should like immediately to add that there are evident exceptions to this law. So, for instance, we are acquainted with a small series of cases in which the apparent therapeutic results are obtained, although the allied substances in question do not possess parasite-destroying qualities. That is the case in the infiltration of the subcutaneous tissues, which is caused by a kind of yeast (sporotrichosis). Here Block proved that the clinically highly therapeutic iodide of potassium first of all dissolves the cells of the infiltration, whilst the parasites, as such, are not in the first instance attacked. But, in any case, it is safer and better for the development of chemotherapy not to build on the basis of exceptional work, but it is better to start with such substances, which produce the destruction of parasites by fixation.

Now it has been assumed in different quarters that some of the more modern remedies are incorrectly regarded as parasiticides, but in reality they are not such; thus, for example, salvarsan or mercury salts are not intended to act directly on the parasites, but indirectly, owing to the fact that they excite the organism to the formation of specific anti-substances. This view is mainly based upon the fact that if one mixes the substances in question, such as, for instance, neosalvarsan with certain pathogenic agents—e.g., spirochætæ in test-tubes—one cannot perceive any reduction in their motility after observing them for hours together. From this fact, which was first discovered by Professor Hata, the conclusion has been drawn that salvarsan or neosalvarsan, as such, did not in any way directly influence the spirochætæ. Now it can very easily be shown that this conclusion is quite incorrect.

If, for instance, one suspends the spirochætæ of relapsing fever in indifferent mixtures of serum which do not injure their vitality, and if one fills two small tubes with them and adds to one of the tubes a very small quantity of salvarsan or neosalvarsan, and if one then centrifugalises, and then draws off the liquid, if one washes the remaining spirochætæ again in a mixture of serum and again centrifugalises it, then one obtains in both tubes a deposit of spirochætæ which on microscopic examination show the same properties—i.e., equally good mobility of the spirochætæ. If, however, the spirochætæ obtained in this manner are injected into test mice, then one can very soon convince oneself that the spirilla treated with salvarsan do not give any infection to the animal, whilst the mice vaccinated with the contents of the control tube promptly show signs of infection. This proves that salvarsan or neosalvarsan, as the case may be, is absorbed by the spirochætæ and must have damaged them, and that this trace of salvarsan, which is so exceedingly minute that it can scarcely be weighed, is sufficient to prevent the increase of the parasites in the animal body. Therefore, by this very simple and easily intelligible experiment the direct effect of salvarsan or neosalvarsan on the spirochætæ, and thereby the principle of fixation, is absolutely proved; the objection of the indirect effect based upon anti-substances therefore falls to the ground.

HOW THE DRUGS ARE FIXED BY THE PARASITES.

It was necessary, however, to penetrate more deeply into the mechanism of this fixation of remedies, and it is only after long-continued efforts that success has been attained in obtaining a clear conception thereof. In order to make practical progress it appeared to be necessary, not to be satisfied with the primordial idea, but to see in what manner the drugs are fixed by the parasites or, as the case may be, by the cells. Only by taking a very roundabout way has it been possible to obtain clearness with respect to these complicated relations, and in this connexion it was especially the studies on trypanosomes, and especially the investigations of "drug-fast" strains of germs, which led to quite definite representations with regard to the process of fixation. There was no difficulty by continued treatment of the experimental mice with certain definite remedies—e.g., fuchsin—in finally obtaining a race of trypanosomes which had become immune against these remedies—i.e., "drug-fast" in the

case mentioned above immune to fuchsin. There were especially three classes of different remedies which were very suited to this purpose: 1. The class of the arsenic compounds, in the following historical order: arsenious acid, arsanilic acid (atoxyl), arsenophenylglycin (salvarsan and neosalvarsan). 2. The class of the so-called azo-dyes (the trypan red, manufactured by Weinberg, with which Shiga and I made experiments, and the trypan blue of Mesnil). 3. Certain basic triphenylmethan dyes (fuchsin, methyl violet, &c.).

When a race of trypanosomes has been rendered immune against fuchsin, then this race is immune against all the allies of fuchsin and methyl violet, &c., but is not immune against the two other classes. Also a race immune against arsenic compounds is only immune against such, but not against the two other classes. We see, therefore, that the immunity is of a quite specific nature, inasmuch as it is limited to a definite class of chemical substances. It was just this specific character which indicated that it must be a question of purely chemical processes. Earlier studies relating to another subject—i.e., those relating to toxins and antitoxins—pointed to the nature of the said processes. In connexion with these it had been shown that the destructive toxins developed their injurious action on the cell by the fact that they are absorbed by certain specific component parts of the cell—side chains—which I have characterised as "receptors," and that the anti-substances represent nothing else than the cell receptors produced in excess under the influence of the toxin and thrown off.

For many reasons I had hesitated about transferring these views relating to receptors to chemical bodies at all, and in this connexion it was especially the brilliant investigations by Langley relating to the effects of alkaloids which caused my doubts to disappear and made the existence of chemo-receptors seem probable to me.

From this point of view the phenomena observed in connexion with the drug-fast strains of germs can be very readily explained experimentally, owing to the fact that the chemo-receptors under the influence of "drug fastness" suffer a reduction of their affinity for certain groupings connected with the remedy which can only be regarded as purely chemical. This reduction in affinity explains in the simplest possible manner why continually increasing quantities of the arsenic compound become necessary for the destruction, e.g., of a race of arsenic-fast trypanosoma, for the smaller avidity can only be overcome by a corresponding surplus of the arsenic compound if the quantity necessary for the destruction of the parasites is to be finally fixed.

We, therefore, come to the conclusion that in the parasites there are present different specific chemo-receptors; for instance, the arseno-receptor which fixes the trivalent group of arsenic as such, and the acetico-receptor which fastens to itself the acetic acid group, an iodine-receptor, an orthoamido-phenol-receptor which conditions the fixation of the salvarsan and many others in addition. A complete exhaustive knowledge of all the different chemo-receptors of a certain definite parasite is what I should like to characterise as the "therapeutic physiology of the parasite cell," and this is a *sine quâ non* of any successful chemo-therapeutic treatment. I should like to emphasise the fact that many observations indicate that certain chemo-receptors are due to several different kinds of parasites, not only to a single one. The knowledge of these is of special practical importance, because remedies which are adjusted to these have a healing influence on a very large series of the most various pathogenic agents. The larger the number of different chemo-receptors, therefore, which can be demonstrated, the greater is the possibility of a successful chemo-therapy.

THE NATURE OF SPECIFIC REMEDIES.

Now, if we seek for specific remedies, then the first condition is that they must possess a certain definite grouping which is chemically allied to one of the chemo-receptors of the parasite. This is only a necessary prior condition of the toxic effect, but in general it is not a sufficient one in itself. Hundreds of substances may fix themselves on a parasite, and only a few are capable of bringing about its destruction. In the therapeutically suitable substance there must, therefore, in addition to the fixing group, which brings about the fixation of the haptophoræ, be another which as such brings about the destruction, and which, therefore, is to be characterised as the "poisoning" or toxophoric. This representation exactly corresponds to the views which we have already long since obtained with respect to toxins, in which we distinguish the presence of a haptophoric group which conditions the cell fixation and also the formation of the antitoxins, and a toxophoric group which brings about the injurious action on the cell. In the case of the highly complicated synthetic drugs the assumption will have to be made that the haptophoric group and the toxophoric group are not directly connected with one another, but as separate groups are linked with a chemical molecule in the character of side chains. In this way we arrive in a natural manner to this, that chemotherapeutic agents built up in a complicated manner may be compared to a poisoned arrow; the fixing group of the drug which anchors to the chemo-receptor of the parasite corresponds to the point of the arrow, the binding member is the shaft, and the poison group is the arrow poison fixed to the shaft of the arrow. Corresponding to this scheme in the case of salvarsan (dioxydiamidoarsenobenzol) the benzol group would correspond to the shaft, the orthoamidophenol group to the point, and the trivalent arsenic group would correspond to the toxophoric group.

If we continue this comparison, then the substances which are used for poisoning the arrows are alkaloids and similar substances, which act injuriously on certain definite vital organs of the body; and so we shall also have to assume that the toxophoric grouping of the synthetic drugs poison the protoplasm of the bacterial cell, and this only appears to be possible when a chemical affinity exists between the toxophoric grouping and the constituents of the cell. The circumstance that all the derivatives of arsenic which contain arsenic in the pentavalent form—i.e., in the fully saturated form—do not bring about any therapeutic action, but that this only commences when the arsenic group exists in the unsaturated condition corresponding to the trivalent radical, certainly points in the same direction. This difference between the saturated and unsaturated arsenic radical was discovered by the master mind of Bunsen, for in the year 1843 in his comparative studies relating to the non-poisonous kakodylic acid with the pentavalent arsenic, and its poisonous reduction product the kakodyl with the trivalent arsenic, he came to the conclusion that "the kakodylic acid had lost the power to form an attacking point, and at the same time it had lost its effect on the organism." In the subsequent period a very large series of analogous cases have become known corresponding to this truth, which point to the increased effectivity of the unsaturated radical. The best known example is doubtless the high degree of toxic power of carbon monoxide as compared with the almost indifferent carbon dioxide. Dyes act as bactericides only as such, but not in the form of their colourless products which correspond to the saturated type. The fact is that all these unsaturated combinations contain unsatisfied avidities which render them capable of reacting additionally with other combinations.

If, therefore, we poison a spirochæta with salvarsan, then there occur at least two different chemical fixations: first of all, the fixation of the excess of orthoamidophenol, which primarily fixes the salvarsan to the parasite. It is only in consequence of this fixation that secondarily the trivalent arsenic group is given the opportunity of entering into chemical combination with the arseno-receptor of the cell, and so to exert its toxic effect. The avidity of the arseno-receptor can in itself be such that it can only react if favouring factors, which chemically must be regarded as a stereo-chemical facilitation, come into action.

Examples of such stereo-chemical facilitations are frequently found in chemistry—e.g., in the chemistry of the ortho-condensations. And so the haptophoric group of the arsenic molecule primarily brings the arsenic along to the cell, and secondarily brings about its possibility of action.

Now, it is a frequent practice of many uncivilised peoples, in order to be certain of killing their enemies, that they not only rub over their arrow with one kind of poison, but with two or three totally different kinds of poison. And so it also appeared advisable to imitate this procedure against the parasites, which is otherwise not very praiseworthy, and to poison our synthetically poisoned arrows not singly but doubly. In association with Dr. Karrer I succeeded in depositing the reduced arsenic compound, e.g., salvarsan, even on metals, and so in arriving at remedies which, used experimentally on animals, show an increased effect.

THE RELATIONSHIP OF THE ORGANOTROPIC AND PARASITROPIC ACTIONS OF DRUGS.

In the previous remarks I have described the conditions which are necessary in order that a certain substance may exert a parasiticidal effect, and indeed must effect such, if it operates directly on certain definite parasites in an aqueous solution, such as, for instance, is the case with the ordinary disinfectants. In the manner described above it is easily possible to arrive at a very large number of substances which will destroy bacteria and allied substances in aqueous solutions. But, of course, the problem is much more difficult when it is a question of internal disinfection or of the destruction of living parasites within the infected organism. If the problem is set before us of sterilising a room, then indeed it is an easy matter to do so, owing to the present advancement of science; but the task becomes more difficult when the room is filled up with materials, and when these materials are of such a delicate sensitiveness as living cells then the difficulty of the problem will be manifest without any further explanation. As a matter of fact, it has been proved that substances which bring about a colossal bactericidal effect in aqueous solutions, even when they are highly diluted, are totally ineffective in therapeutics properly so called. For it has turned out that, generally speaking, these disinfectants are more or less powerful cell poisons, and seriously injure the organism; they are, therefore, not only parasitotropic but also organotropic.

Now, it depends exclusively on the relationship between parasitotropic and organotropic as to whether a certain disinfectant can be used as a remedy. In Robert Koch's celebrated experiment, in which even the largest doses of sublimate did not produce even a trace of therapeutic effect on anthrax infection, it is evident that the parasitotropic effect was reduced to *nil* by the organotropic effect. If the relationship of organotropic to parasitotropic is somewhat more favourable, then one may observe a peculiar phenomenon, consisting in the course of the infection being rendered worse to an extraordinary degree by the remedy, owing to the effect that the parasites increase to a much greater extent than is generally the case.

This phenomenon, discovered by Hata, is explained owing to the fact that the ratio of organotropic effect to parasitotropic effect is of such a nature that almost the whole of the poison is absorbed by the organism, but only in infinitesimal quantities by the parasites. According to a biogenetic foundation principle it is quite a common thing for substances which act destructively in large quantities to bring about an increase in the vital functions in smaller doses. Only such substances; therefore, can be used as therapeutic agents in which the ratio between organotropic and parasitotropic effect is a favourable one, and that can be easily ascertained by experiment by a comparison between *dosis toxica* and *dosis tolerata*. Only such substances can be considered therapeutic agents of which a fraction of the *dosis tolerata* is sufficient to bring about a therapeutic effect.

The organotropic effect of drugs is, of course, to be attributed, according to the views of Langley and myself, to this—that there are, in most various cells of the body and its organs, quite different chemo-receptors, exactly in the same manner as we have postulated for the parasites. Apart from the pharmacological effect of the various remedies, this chemical difference of the organs appears clearly in the vital colouring.

I will mention here—in order only to indicate a few examples—the methyl-blue colouring of the nerve trunks, the neutral red colouring of the cell granules, and the distribution of the isamin blue in the so-called pyrrol cells, so carefully and excellently investigated by Edwin Goldmann.[1] The pathologico-anatomical findings point also to a chemical divergence on principle. When we see that after the introduction of paraphenylendiamine only the summit of the diaphragm assumes a black colouring; when we see that vinylamin in the case of all kinds of animals isolates and injures the renal papillæ and causes them to die; when after the introduction of cyanosin—as Hata and Goldmann have found—certain definite regions in the hair of mice become coloured, and the colouring matter becomes stored in the greatest degree in the milk glands; when a colouring material of the pyronin series in the case of mice brings about a general dropsy amounting to 50–60 per cent. of the body without injuring the kidney, which doubtless is only to be referred to an alteration of the vessels of the subcutaneous connective tissue, then all these phenomena can only be explained by the fact that at these particular spots definite chemical connexions of a specific nature must take place which must be referred to the presence of certain definite chemo-receptors.

[1] THE LANCET, July 12th, 1913, p. 69.

THE VARYING ORGANOTROPIC ACTION OF DIFFERENT ARSENIC COMBINATIONS.

Now, according to the above representations, all these fixations are dependent on the haptophoric grouping of the drugs, and therefore it was a matter of great interest to observe how phenylarsinic acid, the mother substance of the modern arsenic compounds, behaves when various different groups are attached thereto. In this connexion it has turned out that when we introduce different constituent fixation groups—chlorine, the oxygen group, the hydrocyanic acid group, the sulphuric acid group, the ammonia radical—we can manufacture, starting from one substance, a series of combinations the toxic effect of which may vary fifteen hundredfold. The combinations which are to the greatest extent free from poison—these are derivatives of sulphuric acid, especially the sulpho-phenylarsinic acid and their salts—are less toxic than sodium chloride; and, on the other hand, there are substances the very smallest quantities of which bring about death. And in this connexion we can see that according to the nature of the substances very different organs of the animal's body are injured. Sometimes it is the intestinal tract, and the animals die from profuse diarrhœa; sometimes it is the liver, and the mice—a rare occurrence—become jaundiced and die from serious alterations in the liver; sometimes the red blood corpuscles become dissolved and the animals die from severe anæmia. Frequently also the central nervous system becomes injured, and in the case of mice this usually relates to the vestibular nerve of the inner ear. The interference with the equilibrium produced in this way causes the mice to constantly turn in circles just like the Japanese dancing mice. In the case of human beings the optic nerve is the point of attack for numerous derivatives of phenylarsinic acid. The cases of blindness which have been observed after the use of very large doses of atoxyl, arsazetin, and other drugs are due to this injury.

From this it is evident that according to the selection of the group annexed to the phenylarsinic acid quite different organs will be affected. This is only explained according to the above views by the fact that there are, as already previously stated, in the various organs specific chemo-receptors which energetically attract certain fixation groups somewhat as the magnet attracts iron. And this view also provides us with the principle according to which we have to construct our poisoned arrows. We must attach to the phenylarsinic acid group, or as the case may be to the phenyl-arsenobenzol group, such grouping as is only related in a small degree to the organs of the sick body, but, on the other hand, is very closely allied to the receptors of the parasites.

THE QUALITIES OF AN IDEAL REMEDY.

I have explained above that the parasites possess a whole series of chemo-receptors which are specifically different from one another. Now if we can succeed in discovering among them a grouping which has no analogue in the organs of the body, then we should have the possibility of constructing an ideal remedy if we select a haptophoric group which is specially adjusted to the functions of the parasites. A remedy provided with such a haptophoric group would be entirely innocuous in itself, as it is not fixed by the organs; it would, however, strike the parasites with full intensity, and in this sense it would correspond to the immune productions, to the anti-substances discovered by Behring, and which, after the manner of the bewitched balls, fly in search of the enemy. Let us hope that it will be possible chemo-therapeutically to hit the bull's-eye in this manner also. I do not consider this at all out of the question, as it may be proved in certain sicknesses—e.g., spirillosis in hens—that from the fiftieth to the hundredth part of the *dosis tolerata* of salvarsan entirely frees the animals from the parasites and leads to a cure. Such a dose truly represents a *nil* dose, as the hen cannot be damaged thereby in the slightest degree. But such favourable conditions have only very rarely been discovered up to the present; we shall have to

be satisfied if we can succeed in obtaining good therapeutic results with the tenth or even the fifth or sixth portion of the *dosis tolerata*.

In the main the above are the principles which guided us in the construction of the new remedies. Among the numerous combinations which have been tested in experiments on animals in the case of trypanosomes and spirillar infection, and in the preparation of which I have been supported by the untiring coöperation of Dr. Benda, Dr. Bertheim, Dr. Kahn, and Dr. Karrer, and which have been biologically tested, especially by my respected friend Professor Dr. Hata, and later by Dr. Castelli and Dr. Gonder and Frl. Leupold, salvarsan has proved to be the most efficient, the dioxydiamidoarsenobenzol of the formula—

Here the orthoamidophenol group acts as a conducting and the arsenic group acts as a toxophoric group.

THE CLINICAL APPLICATION OF EXPERIMENTAL WORK.

But now, gentlemen, the step from the laboratory to practice, i.e., to the bedside, is an extraordinarily difficult and dangerous one—a step which can only be taken with the greatest care. Its difficulty and danger are in the main based upon two factors.

1. On the fact that in the case of men there exist so-called idiosyncrasies, forms of supersensitiveness which do not occur in the case of animals. So, for instance, it is known that with a large number of thoroughly healthy persons the use of harmless articles of food, such as strawberries, crabs, &c., bring about unpleasant skin eruptions, and almost half the known remedies can incite such phenomena of supersensibility. It will not be a cause of surprise, therefore, that such phenomena may occur in a particularly serious form with the employment of therapeutic agencies which contain such powerful-acting radicals as arsenic and mercury. I have already referred above to the disturbances of vision and cases of blindness which are produced by certain arsenic compounds. Fortunately, it is proved that such primary supersensibility in the case of salvarsan is one of the very rarest phenomena, and that it was perhaps due to a number of other circumstances, sources of error of a hidden nature, which in many cases have led to the mistaken idea that supersensibility existed. In this place we must first of all mention Wechselmann, McIntosh and Fildes, Hort and Penfold, who have brought forward the very important proof that the destroyed bodies of bacteria which may occur in sterilised water are capable of bringing about a series of serious and unpleasant phenomena, such as fever, vomiting, diarrhœa, &c. And even in the case of a pure, unexceptionable water, technical mistakes in the manufacture of the salvarsan solutions may bring about injury; too large an addition of alkali injures the veins used for the injection; too small a degree of alkali brings about blood coagulation, and leads to thrombosis, and a lengthy shaking of the solutions and standing in the air oxidises the drug to a toxic product, the so-called oxide of arsenic, which is much more highly toxic than salvarsan.

2. It has been shown that certain illnesses of a constitutional nature can cause a supersensibility. So, for instance, tuberculosis of the suprarenal region, the so-called Addison's disease, is an illness which, according to the observations of Wechselmann and my own, brings about a severe supersensitiveness of the patients to arsenic compounds, and the same applies also to the status lymphaticus, which, as has already long been known, must be regarded as a type of a constitutional lack of resistance and supersensibility.

Furthermore, the seat and location of the disease may also bring about supersensibility, a supersensibility which is excited by the so-called "local reaction." We are indebted to the master mind of Robert Koch for the first knowledge of this peculiar phenomenon—the well-known tuberculin reaction of the tuberculous focus. Exactly similar reactions may, however, occur when in a focus filled with parasites the parasites are rapidly dissolved. Then under the influence of the liberated toxins an irritation of the tissues sets in which is connected with hyperæmia and swelling, and which is known in the case of the "luetic" illnesses as Jarisch-Herxheimer's reaction. Such reactions are of course of no great importance in connexion with the skin tissues; but if the reacting centres have their seat in the neighbourhood of vital organs (brain), then the swelling may perhaps bring about injury of a nature serious to life, or even death itself. Indeed, it is well known that tuberculous meningitis may be influenced in an exceedingly dangerous manner by a careless tuberculin reaction. In spite of this, however, no one will think of attributing the nervous disturbances to a neurotropia of tuberculin. And exactly the same phenomena may occur with salvarsan also if the spirochætæ of syphilis have localised themselves in the central nervous system.

As you will see, the treatment of patients is an exceedingly difficult and responsible task, and the clinical pioneers such as Schreiber, Wechselmann, Iversen, &c., deserve our warmest thanks. They have thrown the first light upon the most important questions (dosology, indications, and contra-indications). From a series of observations which is now so vast that it can hardly be surveyed there has, however, resulted what I might call the "therapeutic tactics," and which I should here like briefly to explain.

THE THERAPIA STERILISANS MAGNA.

The therapia sterilisans magna consists in this, that by means of one or at most two injections the body is freed from the parasites. In experiments on animals, and also in the case of a series of important maladies, this principle can be carried through in a clear and pure manner. Here, therefore, the old therapeutic remedy is applicable: "*Frapper fort et frapper vite.*" It is a matter of course that the necessary dose must be greater in proportion to the advance of the disease, for it is absolutely clear that if a definite number of parasites is destroyed by a certain definite dose of the remedy, the quantity must be multiplied if the number of parasites—as happens during the course of the infection—has likewise multiplied. Apart from this, by a rapid destruction of the parasites endotoxins are set at liberty which with increasing numbers reach the circulation of the blood in ever increasing concentration. And then frequently at the height of the disease serious or irreparable pathological disturbances occur, such as suppuration or necrosis, which of course continue even when the pathogenic cause has been destroyed, and may lead to unpleasant complications.

I refer here to the typhoid ulcers and to the abscesses and necrosis in the case of horse sickness. Therefore, it is in my opinion necessary to allow the therapeutic treatment to come into action as early as possible, as under these circumstances the full success is most easily and most surely attainable. And it is just in these present times when owing to the progress of diagnosis, and especially the modern assistance rendered by the microscope, and serological investigations which are connected with the names of Widal, Rubner, and Wassermann, we are in a position to recognise the specific infections early, we must select as the first principle of medical treatment: *frapper vite.*

We shall now have to ask ourselves the question, What are the causes which make it possible for such a favourable result to be obtained, a result which may be taken as therapia magna sterilisans, radical cure of the body by means of a single injection? Typical antibodies can be shown to be produced fairly rapidly by the destruction of parasites, and especially the protozoa. Hence it is quite evident that this assisting action of the organism ought to be eminently efficacious. For if the medicine has destroyed not the whole of the parasites but only 95 per cent., and 5 per cent. have resisted its action, then these remaining 5 per cent. are sure to succumb to the influence of the antibodies which are rapidly formed. If this is the case the therapia sterilisans magna is attained.

"RELAPSING CROPS" OF PARASITES.

Unfortunately, it has been shown that this salutary process may frequently be minimised considerably owing to the biological properties of the parasites. For it may happen that a part of the parasites which survive the first

injection escape destruction by the serum either wholly or in part, and subsequently change into new varieties which have become serum proof, and which are known as a relapsing crop. The possibility of forming a relapsing crop largely depends on the nature of the parasites. In the case of spirillosis of fowls, which as is known is a disease taking a typical course, relapsing crops do not seem to form, and therefore the chemotherapeutic cure is an eminently easy one. In cases of recurrent or relapsing fever in human beings the number of the relapsing crops is restricted to 3 to 4. The number of relapses which we have observed clinically corresponds exactly to the existence of the various relapsing strains. On the other hand, other parasites can exist in an extraordinarily great variety of relapsing strains, and in this connexion I need only mention the trypanosomes, and in particular the parasite of human syphilis. In particular, in collaboration with Dr. Röhl and Frl. Gulbransen, and lately with Dr. Ritz, I have been able in the case of mice to produce and to transmit for any length of time eight entirely different forms of growths. It is clear that parasites of this kind which are able to form such a large number of relapsing crops offer very great difficulties in their treatments, as in this case the auxiliary forces of the body fail to act, so that it is necessary to do one's utmost to destroy the whole of the parasites all at once by means of drugs, as owing to their great power of adaption a single germ surviving may perhaps be the cause of the infection breaking out afresh.

CAUSES OF DEFICIENT STERILISATION.

At this juncture the question arises as to what are the causes of some of the germs being able to escape disinfection. If a certain exactly definable quantity of an antiseptic is added to a liquid containing bacteria (suspension of bacteria), a complete disinfection takes place; not a single germ escapes the destructive influence. However, such ideal conditions do not obtain in living organisms. Even in disinfecting a room we sometimes find that in certain places, in the so-called "dead corners" formed by piping, waterpipes, &c., the gases of the disinfectant do not act sufficiently. In like manner the parasites which have settled in such dead corners of the organism are not reached by the medicine. Practical tests have, however, quickly taught us where such dead corners are to be found in the organism; the principal one is the hollow situated between the spinal cord and the dura, which is filled with a liquid as clear as water and almost entirely free from cells and albumin, the cerebro-spinal fluid. This condition of the cerebro-spinal fluid can only be accounted for by the fact that the cells by which it is secreted are in a high degree impervious to most of the constituents of the organism—for example, albumin—and that they only permit a limited quantity of substances with small molecules to pass through. The drugs with more complex molecules are thus kept back, like albumin, and cannot get into the cerebro-spinal fluid. Should, therefore, parasites be lodged in these places, it is impossible for the drug to attack them. This localisation of the parasites is of very special importance in connexion with the parasyphilitic diseases, tabes and paralysis.

Another possible explanation of the deficient sterilisation is this, that among the large number of parasites there may be some which are unaffected by certain drugs, thus resisting sterilisation. On the whole, I am of opinion that this fact does not play a very great part in the course of fresh infection, but that it becomes prominent in connexion with those frequently recurring diseases which are characterised by innumerable relapsing crops, such as sleeping sickness, lues, &c.

Here two possibilities are conceivable: Firstly, if sleeping sickness, for example, is treated with atoxyl in the usual manner, it is possible—as can be demonstrated easily by experiment—for an atoxyl-proof stock to form itself by adaption. But, secondly, as I have already mentioned, the mere continual formation of relapsing crops, likewise in the course of time and of several generations, alone can bring about a change in the chemo-receptors of the parasites, which, according to the circumstances, may result in an increased or a reduced power of resistance of the parasites. For instance, I have found that a trypanosome strain which was not affected by trypan red lost this peculiarity after having passed into a relapsing crop.

We should, of course, expect that certain relapsing crops, and especially those showing a great tendency to relapse, should become much less sensitive than the original stock. And the serious influence of the usual specifics, mercurial and arsenical, upon parasyphilitic diseases, in connexion with which Noguchi has lately proved the presence of living spirilla, tends to show that this is the case here.

MEASURES ADOPTED TO RENDER THE PARASITES ACCESSIBLE.

These few facts and considerations suffice to indicate in which cases we may rely upon the result of the chemotherapeutic treatment being entirely successful, besides being quick, and in which cases such a result is to be obtained less easily and only by a circuitous road. The latter is especially the case with chronically recurring diseases accompanied by localisations not easily reached. If we compare the fight against parasitic diseases with a state of warfare, we find that on the one hand great battles are fought which may lead to victory in the course of one or a few days. In combating bacteria such a victory would compare with therapia magna sterilisata. If, on the other hand, a fortress has to be taken, the goal cannot be reached with one single stroke, but it may take months and even years.

May I be permitted at this juncture briefly to point out the aids which are employed in connexion with a bacteriological siege:—

1. When parasites are lodged in dead corners and are in consequence difficult to reach, it has frequently been found advisable to employ instead of one single injection a long series of injections extending over several weeks, the so-called serial treatment, in accordance with the rule, *Gutta cavat lapidem*, and in this connexion I would specially point to the results which Leredde, of Paris, and Dreyfus, of Frankfort, have obtained by these means.

2. In this connexion it is desirable to employ a therapeutic agent of as small a molecular volume as possible, such as urotropin, which has been successfully employed by S. Flexner in cases of infant paralysis.

3. Various writers (Touton, Duhot, &c.) have suggested rendering the plexus epithelium more pervious to the therapeutic agent by means of certain chemicals, thus causing more of the therapeutic agent to get into the cerebro-spinal fluid. Unfortunately, this method so far has not led to any tangible results.

4. The possibility of making direct injections into the cerebro-spinal canal in order to let more of the therapeutic agent get directly to the parasites contained in the fluid has also suggested itself. Thus Ayres Kopke, of Lisbon, has injected suitable disinfectants into the cerebro-spinal canal; while Swift and Moore, of the Rockefeller Institute, have quite recently adopted a novel and interesting method in the treatment of tabes which promises to be very valuable. They treat the patient by first injecting salvarsan; shortly afterwards they draw blood from him and inject considerable quantities of the serum obtained from this into the spinal canal. This method is not only novel but suitable, in so far as it obviates all possible ill-effects on the sensitive central nervous system by employing serum obtained from the patient himself, while at the same time it is possible to apply the curative in sufficient quantities. The results obtained in this connexion were entirely satisfactory.

It is fairly obvious that all these measures aim on the whole at rendering the places which are not easily accessible more accessible for the therapeutic agent than is the case under ordinary conditions. On the other hand, however, the greater power of resistance of certain parasites has to be taken into account, and this is a purely chemical question which can only be solved by chemical means. The road leading to its solution which promises the best results is that of combined therapy.

COMBINED THERAPY.

From what has been said it will be seen that the combined therapy is best carried out with therapeutic agents which attack entirely different chemo-receptors in the parasites. For instance, it is useless to combine fuchsin with its nearest relative, methyl-violet; and it is useless to combine therapeutically trypan blue and trypan red, for both attack the same spots in the parasites, but it is necessary to select from each group the most effective substance and then to combine the most suitable representatives of the various

types. It is clear that in this manner a simultaneous and varied attack is directed on the parasites, in accordance with the military maxim: "March apart but fight combined."

In this connexion the interesting fact has been brought out that when such combinations are used *quoad* organism, summation of the toxic properties of the various substances need not occur, while, *quoad* parasite, the therapeutic properties can be increased. To quote a case in point. It has been found that a sulphite of p-oxyphenylarsinic acid, which is ten times as poisonous as salvarsan, when added to salvarsan up to a certain percentage, did not render the mixture more poisonous. But the healing properties of the mixture were three to four times greater than those of salvarsan in connexion with trypanosome infection in mice. Such phenomena are quite common in connexion with combined therapy. If one injects a substance, as for instance (*a*) parafuchsine and (*b*) salvarsan, simultaneously, the colouring matter is stored up by other receptors, and finds its way into other organs, than does the salvarsan, so that by this method an increase in the toxicity does not take place, provided the components have been properly selected. In this case ½ plus ½ is not equal to 1, *quoad* affection of the organ, but smaller than 1. On the other hand, both substances are concentrated in the parasites, and their effects can consequently be added, or in favourable cases can be multiplied. We thus obtain the therapeutical inequality ⅓ plus ⅓ plus ⅓ equal to 1.

I have maintained this point for quite a long time, and some very remarkable studies upon the same subject have recently appeared from Morgenroth's laboratory, in which stress is laid on the suitability of multiple, ternary, and quaternary combinations.

Moreover, according to more recent experiments, it seems advisable in connexion with cases where anti-substances are produced, systematically to incorporate these same in the combination, because the anti-substances require a receptor apparatus entirely different in nature from the chemo-receptors. Thus the combination of pneumococcal serum with methyl-hydro cuprein, as tried by Morgenroth, has proved very efficient in connexion with tests on animals executed by Neufeld, while Dr. Bierbaum discovered simultaneously at my institute that exactly the same holds good in connexion with a combination of dysentery serum and salvarsan.

Thus the value of the combinations is clearly shown, as they make it possible, always assuming that suitable substances are used, to effect a cure with the smallest possible doses and in the least harmful manner, and to eliminate any danger resulting from a maximum dose of one of the ingredients. A further advantage of combined therapy is, that under the influence of two different medicines the danger of rendering the parasites immune to arsenic, which naturally would be a very great obstacle in connexion with further treatment, is apparently greatly minimised. Thus it has been shown that in the course of a prolonged quinine treatment it may happen—the cases are fortunately not very frequent—that the malaria parasites become quinine proof, so that therapeutical doses of quinine are no longer able to remove the parasites. If, however, such a patient receives an injection of salvarsan the malaria parasites are destroyed at once, for although they may be quinine proof they are not arsenic proof. Should the doses of salvarsan have been too small to prevent a relapse, and provided further quinine is given to the patient on the parasites again appearing in the blood, a curative effect may be obtained by means of quinine. Consequently the combination of quinine and salvarsan has the effect of neutralising or minimising the quinine-proof qualities of the parasites.

For all these reasons I think that combined therapy will in the future conquer an ever-increasing field of action. Thus, for instance, Broden in the Congo succeeded in connexion with sleeping sickness in the human subject—it is true only in the early stage of this infection, which is so difficult to fight against—in obtaining good results by the combination of salvarsan and two basic colouring matters (trypallavin and tryparosan) by treatment lasting about a week.

It is precisely in the manifold character of the possibilities of combination that I see a special advantage and peculiar possibilities of development. When once we are acquainted with the majority of the chemo-receptors of a particular kind of parasite, which will be a long piece of work, occupying many hands and heads, we shall have the most far-reaching possibilities of simultaneous attack by various agencies. And on this account combined therapeutics are absolutely pluralistic in contrast to antitoxins, which may be said to act rather in one single direction.

PRACTICAL RESULTS.

And now, gentlemen, may I be permitted to refer to a few practical results. You are all aware that with a number of spirillar diseases the principle of therapia sterilisans magna has proved most successful. You are aware that it is possible by one single injection of salvarsan to cure framboesia (yaws), which is also caused by spirochætæ, and is a scourge of the tropics, of curing it completely except in rare cases where unimportant relapses occur; this has been shown by the work of Strong, Koch, and Castellani. Thus, in Surinam a hospital in which over 300 patients with framboesia were constantly under treatment was closed and turned to other uses after the introduction of the salvarsan treatment, as one single injection sufficed to cure the disease, and the patients could all be discharged but two. It is to be hoped that in this way it will be possible altogether to extirpate framboesia. Exactly the same favourable results have been attained with recurring fever in the human subject, the fever immediately subsiding after the injection of salvarsan, and the patients being cured by one injection. The very rare cases of relapse occasionally occurring are also readily curable.

To continue dealing with salvarsan, in syphilis, which is so closely related to framboesia, a fair percentage of cures has been obtained in the very first stage of the disease by a single injection of a large dose, but of course the abortive cure by intensive treatment is far more certain.

With Vincent's angina and the diseases of the mucous membrane of the mouth, which are caused by spirochætæ of the mouth, therapia sterilisans magna is possible; in fact, in many cases a mere local application of salvarsan suffices. I may here further mention tertian malaria, in which form, but in this form alone, salvarsan has proved successful, and blastomycosis (Petersen) and the Aleppo boil. As regards diseases of animals, which can be cured by one single injection of salvarsan, I might specially mention breast-disease of horses, which is of such enormous importance to the military authorities, and lymphangitis epizootica, the African glanders in horses.

Most important are the recent observations of Rogers, who found emetine to be a specific against the very serious amœbic dysentery. And if here it is, indeed, advisable and necessary to repeat the injections, yet the triumph of therapeutics remains unassailed; it is all one to the patient as to whether therapia sterilisans magna or sterilisans fractionata is employed, provided only he is relieved of his sufferings in a harmless manner.

Piroplasmosis also, which exerts a disastrous action, causing serious disease in cattle and dogs, may according to the observations of Nuttal be favourably influenced by a pigment belonging to the class of trypan colouring matters—viz., by trypan blue—which was first composed by Mesnil. As I am informed, the fight against this disease has been taken up in a general manner at Pretoria under the auspices of Theiler. The injections are there performed, not by veterinary surgeons, but by the farmers themselves, and they are glad to save their valuable animals scot-free from this serious disease.

It is indeed easy to understand that the schizomycetes, which in themselves are so much hardier than the tender protozoa and spirochætæ, will offer an increased resistance to the attack of drugs. Naturally here, too, there are fine differences, and it is perhaps no accident that the pneumococcus, the protoplasm of which is, of course, most sensitive, should in the course of treatment also have shown itself to be particularly sensitive. (I refer here to the fine researches of Morgenroth in the treatment of laboratory animals infected with the pneumococcus by means of derivatives of quinine, especially ethyl-hydrocuprin.) But in the case of hardier bacteria, too, such as the bacillus typhosus, the possibility of sterilisation is not beyond hope. The first successful experiments in this sphere were carried out by Conrad on rabbits and later confirmed and extended by Uhlenhuth and his fellow-workers on this species of animal.

If I briefly allude to the very hopeful experiments of Gräfin Linden, who has endeavoured to influence tuberculous infections favourably by means of combinations of copper and lecithin, and if I add that salvarsan also has been

shown to have a beneficial action upon the malignant anthrax bacillus and upon that of glanders, and possibly upon that of erysipelas, both in animal experiments, and occasionally, too, in human cases, then all that we know about the chemicotherapeutics of the specific bacterial diseases has been told, so that it is just in this direction that there lies a wide field still to be worked. This field, important as it is, is still in the very first stages of experimentation.

A GLANCE AT THE ADVANCES IN REGARD TO INFECTIOUS DISEASES.

And if after what has been said we cast a glance over the development of medicine, and especially of the fight against infectious diseases, we must recognise that in the last 50 years the most important advances have been made in every direction, advances connected, above all, with the names of Pasteur, Robert Koch, and von Behring. On the one hand, we have the isolation of the pathogenic bacteria, which was made possible really by the Koch method of the solid culture medium, and in which Robert Koch's pupils and fellow workers, Löffler, Gaffkey, Pfeiffer, in the first order, participated; the study of the protozoa, which started from Laveran's discovery of the germ of malaria; the discovery by Löffler and Frosch, Roux and Nocard, of the viruses, which pass through filters; the recognition of insects as intermediate hosts and transmitters of infectious diseases, which is connected with the name of Theobald Smith, and which has led to the most important conclusions. On the other hand, we have the study of the immunity theory, which was first inaugurated so brilliantly by Metchnikoff, and which received a new impetus from the wonderful discovery of antitoxin by von Behring, through which a wide new field, that of the science of immunity and the investigation of serums, was opened up, on which Pfeiffer, Bordet, Widal, Wassermann, and many others, including myself, have worked with successful results. Some of the most valuable fruits of these labours from a practical point of view have been the diagnosis of diseases first in the form of the Widal-Gruber reaction, and later the Wassermann syphilis reaction, the importance of which for diagnosis and therapeutics cannot be estimated.

All these discoveries, especially in regard to the ways of spreading diseases on the part of the infecting agencies, have in accordance with the principle that "prevention is better than cure," been made good use of in the fight against epidemics and for prophylactic measures, and have brought about an improvement surpassing expectation. In the second place, the struggle with diseases which have already broken out has been able to derive advantages from these discoveries, the most wonderful example being the diphtheria serum.

THE HOPEFUL PROSPECTS OF CHEMOTHERAPY.

Now that the liability to, and danger of, disease are to a great extent circumscribed, so far as epidemics and many other diseases are concerned, the efforts of chemotherapeutics are directed as far as possible to fill up the gaps left in this ring, more especially to bring healing to diseases in which the natural powers of the organism are insufficient. And I believe that now, when definite and sure foundations have been laid for the scientific principles and the method of chemotherapeutics, the way is visible before us; not always an easy but yet a practicable way. In the diseases involving protozoa and spirilla extraordinarily favourable results, as I have shown, have already been gained, which can also satisfy far-reaching tests. There are many valuable indications that in a series of other diseases—small-pox, scarlet fever, typhus exanthematicus, perhaps also yellow fever, and, above all, infectious diseases caused by invisible germs—the prospects of success are brightening. But in contradistinction to these superparasites the ordinary or common bacterial diseases (diseases due to the streptococcus and the staphylococcus, coli, typhoid, and dysentery, but, above all, tuberculosis) will still require a hard struggle. Nevertheless, I look forward with full confidence to this development also, and might without being set down as an optimist put forward the view that in the next five years we shall have advances of the highest importance to record in this field of research. There are, indeed, problems which often prove too great for the powers of individuals and can only be solved by a many-sided effort. Considering the enormous number of chemical combinations which are taken into consideration in a struggle with diseases, it will always be a caprice of chance, or fortune, or of intuition, which decides which investigator gets into his hands the substances which turn out to be the very best materials for fighting the diseases or the basal substances for the discovery of such. But the chances in favour of finding a real cure, and so of winning the big prize, will naturally rise with the number of those who occupy themselves with the definite problem. It is just at this point above all that necessity arises to gather and unite all powers, and here special force attaches to that motto, "Viribus unitis," which gives guidance in so many other fields, which in so exemplary and fine a way is the foundation of this great International Congress, to which thousands have been drawn from all lands to give their testimony that in the world of science all national barriers have disappeared.

An Address
ON
HEREDITY.

Delivered before the Seventeenth International Congress of Medicine

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GENTLEMEN,—Let me on behalf of my colleagues, the students of genetics, express our deep sense of the honour conferred upon us by the organisation of your Congress in choosing our science as the subject of one of the general addresses. It is scarcely necessary that I should say on my own behalf that I feel it an extraordinary privilege to be permitted to represent that science on such an occasion.

INTRODUCTORY REMARKS.

This is a great privilege, but it entails also a very grave responsibility. Conscious as we are of the exceptional significance that the study of heredity must before long assume, it would be mere affectation were I to suggest any misgiving as to the propriety of allotting to this subject a conspicuous position in your deliberations. To the penetrative foresight of Francis Galton it was evident long ago that these aspects of physiology must one day become one of the chief preoccupations of reflecting minds. That inference he drew from a broad contemplation of the facts of descent. Traces of order among those phenomena he did indeed perceive, and by great labour and ingenuity he even gave numerical expression to his conclusions. But great as his services were in attracting attention to the problem, no one before the rediscovery of Mendel's work had ventured to imagine that the confusion, the paradoxes, the capricious disorder of the phenomena of descent were, in very great measure, capable of a simple and ready analysis. It is this knowledge which has given to genetic science a position paramount among the branches of physiology, showing that in accurate genetic analysis a means is given not merely of elucidating the interrelations of parent and offspring—the immediate subject of our investigations—but of contributing also to a right interpretation of various special problems of pathology and of anthropology, perhaps, also, to a true understanding of the course of human history, and certainly to the direction and control of the destinies of mankind. Knowing, as I must, that the manner in which these issues are presented to you to-day cannot fail to influence in some measure the development of genetic study in the medical world, I should be insensitive did I not feel how responsible is the position I now occupy. Most of all I fear that I may seem in some degree to exaggerate, not the importance of the principles already ascertained, but the precision with which they can be shown to apply in the special cases of human physiology. In all the arts, perhaps most in the art of exposition, the hardest thing is to simplify the presentation by the omission of detail, and at the same time to leave the picture true to natural fact. So let me, therefore, at the outset say that in regard to almost every instance of principle I

shall bring before you, though rule may be perceived, we have evidence of exceptions also. This is true even of the rules traced by minute analysis in the plants and animals amenable to experiment, and necessarily far more true of the human phenomena, which are brought within our reach for the most part by imperfect records. As in every department of physiological advance, we have first to trace the course of those great sweeping curves which lead to the recognition of ascertained law, and later those minor deviations, perhaps equally significant, which must hereafter be the subject of a further analysis.

THE MENDELIAN PRINCIPLE.

Now the essence of Mendelian principle is very easily expressed. It is, first, that in great measure the properties of organisms are due to the presence of distinct, detachable elements, separately transmitted in heredity; and secondly, that the parent cannot pass on to offspring an element—and consequently the corresponding property—which it does not itself possess. The determination or recognition of these elements by analytical breeding is one of the main objects of present-day genetic research. Each germ cell, ovum, or sperm may contain or be devoid of any of these elements; and since all ordinary animals and plants arise by the union of two germ cells in fertilisation, each resulting individual may obviously receive in fertilisation similar elements from both parents or from neither. In these cases the offspring is "pure" bred for the presence of the character in question, or for its absence. But it may be formed by the union of dissimilar germs, one containing the element, the other devoid of it, and in this case we call the individual cross-bred, or heterozygous in that respect.

A population thus consists of three classes of individuals, those pure for the presence, having received two doses of an element; those pure for the absence of the element, having received none of it; and the crossbreds, which have received one dose only. From the physiological standpoint it is of great importance to distinguish the positive from the negative characteristic. But since it often happens that the full effect is produced in the organism by one dose only of a character, we have felt justified in regarding this positive effect as the sign or proof that it is caused by something present. A plant, for example, though crossbred for tallness, may be as tall as one purebred for tallness. Each dwarf plant, whatever be its parentage, can only produce dwarf offspring. Not having tallness it cannot transmit that property. A crossbred tall plant can, by self-fertilisation, produce both tall and dwarf offspring. Fowls with silky feathers cannot, if bred together, have offspring with normal feathers, but two birds, normal to all appearance, can, if they be crossbred in that respect, produce silky offspring.

At a later stage we will consider to what extent we are justified in thus discriminating between the positive and the negative characters, but for the present we will note that, as a matter of symbolical expression, the distinction is immaterial. Now, the organism produces germ cells representing in equal number the characteristics of the germ cells whence it arose. There is, as we call it, segregation between the elements introduced from the parent. The double structure of the soma is, when the germ cells are formed, resolved into the single structures of the germ cells. If the organism is pure bred in any respect, all its germ cells are alike in that respect. If it is cross-bred, its germ cells represent in equal numbers the positive or negative elements which were brought together in fertilisation. In consequence, the numbers of individuals resulting from the various possible forms of union follow regular arithmetical rules, and the proportions in which the several classes appear give us the means of tracing and identifying the various systems of descent.

CONDITIONS SHOWING DOMINANT DESCENT.

It was naturally with great interest that we began the examination of human pedigrees, and the result of that search soon showed that many of the more definite hereditary diseases and malformations follow one or other of the systems with which Mendelian analysis has familiarised us. The first condition thus recognised to have a simple Mendelian inheritance was the peculiar malformation known as brachydactyly described in America by Farabee. Another example is congenital cataract studied by Nettleship, to whose admirable researches we owe many of our most valuable and instructive pedigrees. Both these conditions descend as dominants. It is characteristic of them that unaffected members of the families do not transmit. Not having in them the critical element which causes the condition, they cannot pass it on to their posterity. In the human examples the individuals affected are almost always heterozygous, and hence among the children which are born to their marriages with normal persons we expect the affected and unaffected to be in equal numbers.

Since then such pedigrees have been recognised in abundance. The collection of such evidence we owe especially to Nettleship, Gossage, Drinkwater, Lundborg, Weil, Bulloch, and to many more also. Some of the conditions, which may be stated with fair confidence to descend commonly as dominants, are the following: Brachydactyly, claw-shaped extremities, cartilaginous exostoses, membranous cranio-cleido-dysostosis, hypoplasia of the teeth, diabetes insipidus, chronic trophoedema (generally).

Skin affections: Tylosis, epidermolysis bullosa, telangiectasis, hypotrichosis, porokeratosis, and xanthoma.

Ophthalmic diseases: Pre-senile cataract, ectopia lentis (sometimes), coloboma (sometimes), distichiasis, night-blindness (certain forms), and retinitis pigmentosa (sometimes).

Nervous diseases: Angio-neurotic œdema, tremor hereditarius, Huntington's chorea, ptosis, and probably several of the forms of spastic paralysis and of myo-atrophy.

Respecting nearly all these it may be remarked that exceptional cases, many undoubtedly authentic, are on record in which affected children have been born to parents actually or apparently normal. Many of these exceptions are undoubtedly genuine and serious, but others may be ascribed to irregularities in the age of incidence, and to mistakes as to slight cases.

Another difficulty arises from the fact that the numbers are frequently irregular. This is in part caused by imperfection in the records. In part, however, I think these aberrations point to real peculiarities in the process of segregation. We know well that in certain plants like wheat and peas the expected numbers appear with great constancy, but in others, as stocks and the primulas, long "runs" are so common that smooth results are only obtained by the summation of large series of observations. We are perhaps right in conceiving the germinal tissue of a heterozygote as an emulsion of the two types, sometimes coarse, sometimes fine, and the degree of smoothness of the results may be an indication of its state in this respect.

In regard to a large group of diseases of nervous origin, such as Friedreich's disease, Thomsen's disease, and others, these sources of difficulty are especially serious, and though from study of many genealogies I have come to the conclusion that most of them are essentially dominants, I offer this opinion with reserve.

RECESSIVE CONDITIONS.

Of recessive conditions in man we have less abundant evidence. Inasmuch as they usually appear from the unions of parents both apparently normal, though heterozygous for the condition, their occurrence is rare and sporadic. Lundborg has shown with great probability that paralysis agitans is one of these. The constant intermarriage of families in the valleys of Sweden, Norway, and the Alps gives the best opportunity for the study of this form of descent. Lately, also, the American students of genetics have produced evidence making it clear that feeble-mindedness has at least one of the marked features of a recessive condition. When both parents are feeble-minded they have no normal children. It is nevertheless difficult to regard this condition as a simple recessive, for unions of the feeble-minded with normal parents almost always produce some feeble-minded children. Among our experimental families of plants and animals there are mysterious examples somewhat comparable with those, but the exact nature of the complication is still obscure.

Other conditions which exhibit a behaviour characteristic of recessives are albinism, myoclonus, epilepsy, and alkaptonuria. They may all appear in the children of normal persons, with special frequency as the result of marriages of related parents, and there can be no reasonable doubt that these conditions are due to the loss of some factor present in normal persons.

At this stage attention should be called to a remarkable group of cases in which the appearance of abnormality may

almost without doubt be regarded as partially dependent on the conditions to which the soma is subjected. Of these I may mention in particular some of the congenital abnormalities, such as hallux valgus, and some of the congenital deformities of the joints, as, for example, dislocation of the hip or of the radius. In these cases we meet the curious fact that whereas the condition most usually appears in the offspring of normal parents, it may, in certain families, be transmitted from parent to offspring as a dominant. I am inclined to compare these phenomena with those so often witnessed in incubating eggs. When the incubators are not running uniformly many of the chickens are born with deformed feet. Such abnormality, however, is found with especial frequency in particular strains of birds, though eggs from other strains exposed to the same conditions may give perfectly normal results. The liability is the thing transmitted, but without the appropriate conditions the effect is not produced.

DESCENT OF SEX-LIMITED TYPE.

The next group of cases to which I would call your attention is one in which the descent of the abnormality is limited wholly or partially by sex. Of these the best known examples are those of the descent of colour-blindness, hæmophilia, and one of the forms of nystagmus.

In regard to colour-blindness, the fact has long been known that males are affected with exceptional frequency. Colour-blindness among women is decidedly rare. Horner was, I think, the first to call attention to the fact that in the pedigrees of this condition there is remarkable regularity. Normal women transmit the affection to their sons, whereas colour-blind males with rare exceptions have only normal offspring. It is possible to interpret these phenomena by the suggestion to which several of us inclined some years ago, that colour-blindness is a dominant, inasmuch as the normal males cannot transmit it. We were led to regard the condition as due to the presence of something inhibiting normal colour sense rather than to the absence of the factor to which that sense is due. Further investigation has, however, thrown doubt on this simple account. As to the descent, however, there is no doubt that the sons of colour-blind males do not inherit the peculiarity, and therefore cannot transmit it. The daughters of colour-blind fathers inherit it, and though it does not appear in them, probably all of them have the power of transmitting it to their sons. Knowledge derived from direct experimental breeding of various animals has provided a very remarkable scheme by which this course of descent can be represented factorially. One of the simplest of such examples is that of the inheritance of colour in Sebright bantams. When a cross is made between a golden hen and a silver cock, all the chickens come silver, but when a reciprocal cross is made, a silver hen being mated with a golden cock, the pullets come golden but the cockerels come silver. In this case we must regard the silver as dependent on the presence of dominant factors, and the golden as due to its absences. The silver male is pure for silver SS, having received that factor from both parents, but no pure silver hen exists. The hen is heterozygous for silver and may be represented as Ss. We must further regard the hen as also heterozygous for femaleness, Ff. In the formation of the eggs there is what we call repulsion between the factor F and the factor S; the two are not present together in any egg. Those eggs which are destined to become males carry factor S, and those eggs which are destined to become females carry factor F. Now in colour-blindness the repulsion that has been so clearly proved between these factors may be represented as acting in the germ cells of the male between the factor for maleness and the factor for colour-blindness; such that the sperms destined to become males carry factor M but do not carry the factor for colour-blindness, which passes entirely into those sperms which are destined to produce females. It is evident that females heterozygous for colour-blindness are not colour-blind, and that colour-blind females can only be produced by the meeting of two germ cells both bearing the affection.

It follows from the hypothesis that the sons of colour-blind women will all be colour-blind, and all the records of such families with which I am acquainted, with a single doubtful exception, are in agreement, in that the sons of such women were all colour-blind. It is practically certain that the same system of descent holds for a form of nystagmus, respecting which Nettleship has recently collected some important genealogies. As to the other sex-limited conditions in man I can only say a few words. Hæmophilia is the most familiarly known of these. It is likely that the condition in men follows the same descent as that established in the cases of colour-blindness, but inasmuch as males affected with the condition very rarely live to the age of puberty, little is known of their powers of transmission.

I have already spoken of night-blindness as a condition which descends as a dominant, but it is very interesting that Nettleship has lately published certain pedigrees of night-blindness in which the descent is of the sex-limited type. This particular night-blindness is apparently associated always with a high degree of myopia, and I suppose there can be little doubt that the recognition of the genetic distinction will lead to the discrimination of pathological differences also.

THE QUESTION OF INHIBITING FACTORS.

At an earlier stage of this lecture I mentioned a doubt as to the justice of the inference that the characteristics which behave as dominants are due to the presence of factors, and to that point I must now return. In our experimental studies of animals and plants we are aware that certain negative characteristics may be produced not by the absence of a quality, but by the presence of some factor which inhibits its expression. In illustration I may give as an example the Chinese primrose. These plants may have their flowers coloured or white, and we are aware that the white may owe their whiteness in certain cases to the absence of colour—in which case, on a cross with the coloured form, the offspring are all coloured; whereas other whites contain something which destroys or inhibits the development of the pigment factors contained in them.

In view of these examples the question fairly arises whether some of the dominants whose descent I have traced in human pedigrees may not in reality be due to the absence of some factor which in normal persons prevents such development. This suggestion was prominently brought forward by Doncaster in regard to colour-blindness. He lately suggested a scheme according to which we should regard all normal males of the population as heterozygous Nn for the factor N normality, and all ordinary females as homozygous NN for the same factor. In either case the course of the descent would, both qualitatively and numerically, be the same. Between these two methods of representation we cannot as yet distinguish. The point is of great importance in another respect. The question will be prominent in most of your minds, whence do these dominant factors come? Whereas it is comparatively easy to conceive some process by which some elements of the composition may be lost, we are quite unable to suggest any source from which a factor may be derived or any mode by which it may be taken into the genetic system of the organism. We have been accustomed to speak of factors as being added to, or subtracted from, the sum total of an individual composition, but as to the actual origin of new dominants there is very little contemporary evidence.

In the case of those animals, such as the fowl, the wild original of which we think we know, many factors exist in our domesticated breeds which are not possessed by any of the wild species. No wild species, for example, has the complicated combs that we know in our domesticated breeds. None has the dominant white colour of the leghorn; and many other such instances might be given. How have these elements been added to the composition of the fowl?

The problem is exactly parallel to that constituted by the occurrence of brachydactyly or night blindness in man. We can only trace back these peculiarities to a single individual of whose origin nothing is known, but whence did he derive the factor to which he owes his peculiarity? We may compare these cases with those of the origin of an infectious disease, such as typhoid fever. When a medical officer of health recognises typhoid in his district he knows that it must have come from some definite source of infection, and but for one feature in the descent of dominants we might be tempted to suggest that they also arose through the introduction of some element from without into the system. I see no *a priori* impossibility in such a belief, but in these

dominants we know that the distribution among the germ cells is approximately symmetrical, and nothing that we know of animals and plants justifies the suggestion that a foreign element can be so treated in gametogenesis. Perverse as such a suggestion may appear, I do not think we should close our minds to the possibility that these dominants arise by a process of loss of some inhibiting factor. Until we have some far more direct method of recognising the presence of factors this suggestion cannot be positively gainsaid.

Let me call your attention also to the inference which this suggestion would have on our conceptions of evolution. We might extend the same reasoning to all cases of genetic variation, and thus conceive of all alike as due to loss of elements present in the original complex. For all practical purposes of symbolic expression we can still continue to use in our analyses the modes of representation hitherto adopted, but we must not, merely on the ground of apparent perversity, refuse to admit that the lines of argument here indicated may prove sound.

INHERITANCE OF NORMAL CHARACTERISTICS.

Much as we now know of the inheritance of these abnormal characters, some common, others rare, we know little of the descent of the normal characteristics of an ordinary human population. Indeed, the only characteristics as to the genetic nature of which we have clear evidence are the colour of the iris and, to some extent, the colour of the hair. Our knowledge of these is derived from the work of Hurst; he it was who first succeeded in determining the inheritance of eye colour, which had long been a puzzle to anthropologists. The facts which he collected clearly showed that the presence of pigment on the front of the iris—the condition commonly known as brown or black eyes—is a dominant, whereas the absence of this pigment—the eyes we variously call grey or blue—is a recessive. And so far, though I anticipate the possibility of exceptions, no example has yet been produced of two parents critically known to have blue eyes producing offspring with brown or black eyes. As similarly shown, red hair behaves as a recessive, and I understand that at the forthcoming meeting of the British Association in Birmingham he will arrange a demonstration of this as exemplified by the inhabitants of a Midland village.

From the records of portraits of the Royal house of Hapsburg it is clear that the familiar facial peculiarities of the family behave with fair regularity as a dominant, and there are indications that several of the artistic gifts follow with some accuracy the course characteristic of recessives. By careful observation and record it would undoubtedly be easy to extend the list.

DESCENT OF INSANITY AND OTHER CONDITIONS.

Referring to the descent of various forms of insanity nothing has been made out with certainty with the exceptions that I have mentioned: hereditary chorea, which behaves as a dominant, and the condition somewhat vaguely described as feeble-mindedness, which behaves as a recessive. The genetic analysis of insanity is at the present time practically impossible from the fact that the diagnosis of the various forms of insanity is by no means clear, and also from the fact that the conditions of life have obviously much to do with the development of such weaknesses. Similar difficulties arise in regard to deaf-mutism. It is not in question that this condition is very often transmitted, but forms of deafness are so various, and there is such uncertainty as to the nature of the condition in any given case, that we cannot expect to perceive the operation of any regular system here. It is not impossible, also, that in regard to the descent of liability to infectious disease we may hereafter trace in man rules similar to those which have now been established in certain plants, especially by Biffen.

THE NATURE AND TIME OF SEGREGATION.

I propose now briefly to allude to some other significant aspects of these results. First, as to the nature of segregation. This, I think, we must regard as a process comparable with the mechanical separation of substances which will not mix, or mix imperfectly; whereas some factors are continually transmitted in their entirety, others are liable to be broken up by what I regard as a process of quantitative fraction occurring in the mechanical dissociation of the elements at certain critical cell divisions. As to which are the critical cell divisions we have no clear indication. I cannot agree with those of my colleagues who think segregation must occur exclusively in the maturation processes. The case of the double Stock, in which the whole male side of the plant differs genetically from the female side, as proved by Miss Saunders, shows almost conclusively that segregation may occur in somatic divisions. It is also difficult otherwise to interpret the fact that in certain cases the parental combination influences the distribution of factors among the gametes so that the distribution among the grandchildren is different according to the way in which the characters were combined in their grandparents. Into these details I cannot now enter.

THE DEFINITENESS AND FIXITY OF THE LAWS OF DESCENT.

The tendency of our work, as you will perceive, is more and more to exhibit the definiteness and fixity of the laws of descent. The medical man, justly proud of what he can do to make good bodily shortcomings, looks naturally to the conditions of life as the influences which chiefly determine destiny. The statesman, to whom physiological fact is a mystery that he rarely feels any desire to explore, inclines naturally to a similar conception of life. There are signs that more true views are beginning to prevail. It is impossible to study such pedigrees as those of night blindness, in which a condition introduced by one individual into a community hundreds of years ago continues to be perpetuated according to definite arithmetical rules among a remote posterity, without being impressed with the fact that whatever influences may be brought to bear by hygiene or by education the ultimate decision rests with the germ cells. Evolutionary change is effected not so much by gradual transformation of masses under ameliorating or detrimental conditions, but in the main by the occurrence of individual and sporadic variation.

EUGENICS AND LEGISLATION.

It is beyond my province to discuss in detail the practical question denoted by the word eugenics. Those who are engaged in the work of physiological analysis probably do well to keep clear of those distractions. The direction, however, in which genetic research points is not difficult to determine. Sir James Crichton-Browne has discussed at this Congress the striking percentage increase of lunacy in recent decades, and, as always when such topics are under consideration, there are persons disposed to lay the blame on the conditions of life, the severity of the modern struggle, a greater or less consumption of alcohol or other drugs, and so forth; those, however, who have some knowledge of genetic physiology are aware that the whole force of modern science and legislation has hitherto been exercised in the preservation of defective strains in our midst, and will not feel serious hesitation as to the true cause of the increase.

The Mental Deficiency Bill we recognise as, in principle, a wise beginning of reform, but, on the other hand, we cannot hear without disquietude of the violent measures that are being adopted in certain parts of the United States with similar objects. It is one thing to check reproduction of hopeless defectives, but another to organise a wholesale tampering with the structure of the population, such as will follow if any marriage not regarded by officials as eugenic is liable to prohibition. This measure, we are told, is actually proposed in some of the States in America. Nothing yet ascertained by genetic science justifies such a course, and we may well wonder how genius and the arts will fare in a community constructed according to the ideals of State Legislature.

Philologists tell us that by an irony of development the word "dull" comes from the same original which in Dutch has become "dol"—mad, and is better known to most of us in the German equivalent "toll." But I anticipate that, connected as the ideas may be, we might by ridding our community of mania leave it gravely infected with dulness. There are other no less obvious considerations which I might develop, but I trust I have said enough to show that in the experimental analysis of genetics we have an instrument of novel and extraordinary power, and I am not alone in foreseeing that genetic science must profoundly influence the course of human thought and ultimately the conduct of society.

An Address
ON
THE RELATIONSHIP BETWEEN MEDICINE AND PUBLIC HEALTH.

Delivered before the Seventeenth International Congress of Medicine on Tuesday, August 12th, 1913,

BY THE RIGHT HON. JOHN BURNS, M.P.,
PRESIDENT OF THE LOCAL GOVERNMENT BOARD.

MR. PRESIDENT, LADIES, AND GENTLEMEN,—I much appreciate this opportunity of addressing an audience which is representative of the medical culture of the entire civilised world, an audience of men who have assembled to interchange experience, to report progress, and to give and receive mutual enlightenment in their glorious work for the benefit of suffering humanity.

My intention in addressing you to-day is, in the first place, to bear my testimony to the immense debt of gratitude owing to you by the whole of humanity. Arising out of this my remarks will in the main be concerned with the intimate relationship which exists between medicine and public health.

When speaking of the marvellous lowering that has taken place in the death-rate in this country, one is perhaps too apt to remember only social and sanitary progress as the explanation of this great change. My address to you to-day may, I trust, serve to show the appreciation by the public of the fact that to a very large extent humanity is indebted for the saving of life and of suffering that has occurred to the vast improvements in the science of cure as well as of prevention of disease,

As a layman, I cannot attempt to set out the details of the marvellous progress of medicine, especially in its relation to public health, since you met last in London in 1881, and in the years preceding that meeting. Were I to attempt that task not a single nationality represented here would fail to claim names of honour in the record. My imperfect record can give only a few of the names that will be familiar to you: Norway has had its Hansen, Russia its Pawlov and Metschnikoff (lent to France), Austro-Hungary its Semmelweis, France its Pasteur, Budin, and Roux, Italy its Celli and Marchiafava, Belgium its Bordet, Holland its Eijkman, Japan its Takaki and Kitasato, Germany its Koch and Ehrlich, America its Oliver Wendell Holmes, Morton, Read, Carroll, and Flexner, and the United Kingdom its Farr, Simpson, Jenner, Lister, Manson, and Ross.

I do not forget that I am here as the representative of public health in this country, and my remarks will be made chiefly from that standpoint. Although no impending triumphs of preventive medicine are likely to cause your glorious work in assuaging suffering to cease, I look forward to the time, which has indeed already partially come, when the family doctor will be engaged in advising as to means for preventing disease, in dissuading from habits inimical to health, in preventing overwork or laziness—both serious enemies of mankind,—in reporting external conditions, whether of work or leisure, needing to be amended, and still more often in discovering the early symptoms of illness which if neglected may produce serious disease, and in securing the removal of their cause.

We have already glimpses of important directions in which this ideal of future work is being realised. I refer to the modern campaigns against tuberculosis, in aid of child welfare, and in connexion with school medical inspection, which are rapidly becoming part of the national life in this and in other countries. The national system of medical inspection of scholars, and the "following up" of disease or disorder discovered at these inspections, is a work of the highest national importance. It is not only important in itself, but also in discovering a large amount of neglected illness, which should have received attention before school-life, and to which child welfare work is now being increasingly directed. In all these relationships we are realising to an increasing extent the essential continuity and interchangeability between treatment and prevention, in our efforts to reduce disabling disease.

THE PAST SAVING OF LIFE.

Some conception of the progress already secured by the application of science, especially medical and sanitary science, to the problem of healthy living—and I trust at the same time some impetus to further triumphs on the part of your profession—may be given by the comparison to which I invite your consideration of the average experience of England and Wales during the three years 1909–11 as compared with its experience during three years based on the average experience of 1871–80. In the three years 1909–11, 1,529,060 deaths occurred in England and Wales. This number is 772,811 fewer than would have occurred had the average death-rate of 1871–80 held good for these three years. As shown in the following figures, the largest share of this saving of life during three years has occurred in the working years of life, and the gain thus secured to the economic capacity of the nation has been on a gigantic scale.

Comparing the aggregate experience of the three years 1909–11 in England and Wales with the experience of three years based on the average death-rate for the decennium 1871–80:—

The saving of life in these 3 years at ages—

0–1	was over	98,000 persons.
1–5	,,	126,000 ,,
5–15	,,	44,000 ,,
15–25	,,	58,000 ,,
25–35	,,	78,000 ,,
35–45	,,	77,000 ,,
45–55	,,	50,000 ,,
55 and over	,,	114,000 ,,

The saving under certain special diseases is set out below. Comparing the aggregate experience of the three years 1909–11 with the experience of three years of the decennium 1871–80:—

The saving of life in 3 years in respect of—

Small-pox	was	25,463
Measles	,,	7,824
Scarlet fever	,,	69,974
Whooping-cough	,,	30,884
Fevers (typhus, enteric, simple continued fever)	,,	45,339
Puerperal fever	,,	3,941
Diarrhœa, dysentery, and cholera	,,	32,996
Pulmonary tuberculosis	,,	114,799
Other tuberculous diseases	,,	56,338
Total saving on these diseases		367,008

Nearly half the total saving has occurred under the heading of the diseases here enumerated, If we take the whole of the 32 years 1881 to 1912, and considered the saving of life during this period, the figures are truly colossal. During these 32 years, in England and Wales 17,083,751 deaths occurred. Had the relatively high death-rates of 1871–80 continued during each of these 32 years with the populations of each of these years, 3,942,000 more deaths would have occurred than were actually experienced.

Expenditure of local authorities.—It is interesting to contrast the saving of life actually experienced during the last 32 years with the expenditure incurred by local authorities (sanitary and Poor-law authorities, county councils, joint hospital boards, &c.) during the 40 years 1870 to 1909–10. During this period the total expenditure of all local authorities in England and Wales exceeded 3000 millions sterling, of which amount over 500 millions was obtained on loan since the year 1882–3. At the end of 1909–10 the total indebtedness of local authorities exceeded 536 millions sterling, or about seven-tenths of the amount of the National Debt.

In the following table an analysis is made of the main items of loans by local authorities which may be regarded as

directly or indirectly concerns of public health, and a comparison is made with the corresponding items for 1883–4. The figures are stated in round numbers.

	1883–4		1909–10
	£		£
Total outstanding debt for all purposes ...	165,000,000	...	536,000,000
Outstanding debt incurred in respect of—			
Schools	14,000,000	...	46,000,000
Highways, &c....	17,000,000	...	57,000,000
Waterworks	29,000,000	...	127,000,000[1]
Sewerage and sewage disposal	15,000,000	...	42,000,000
Housing	3,500,000	...	10,800,000
Hospitals	182,000	...	4,600,000[2]

The above statement does not include municipal and Poor-law expenditure on the supply of gas, electricity, tramways, harbours, on asylums, police, markets, workhouses, &c.

Since 1882–3 local authorities have expended out of rates and by means of loans the following sums:—

Education	£320,000,000
Highways, bridges, and ferries	289,000,000
Waterworks	131,000,000
Sewerage and sewage disposal	89,000,000
Hospitals (not including Metropolitan Asylums Board and workhouse infirmaries)	20,000,000
Housing of working classes	11,000,000
	£860,000,000

A large proportion of the total sums mentioned above has been expended by local authorities on objects which are unrelated to the public health, though they may have increased the public comfort. The expenditure on education has doubtless helped the public health as well as national efficiency, though only a share of this expenditure should be allotted to the former heading. If we assume that 500 millions sterling have been expended which can be rightly associated with the saving of nearly 4,000,000 lives which has occurred during the last 32 years, and if we take the average economic value of a life saved—i.e., prolonged to an older age—to be £150, a very modest estimate, evidently even this large sum can be regarded as having been a profitable investment. It has to be remembered that the benefit of many of the large capital expenditures on water-supplies, sewerage, housing, hospitals, &c., will be reaped even more in the future than in the record of the past.

Periods of progress.—How has the saving of life already achieved been secured? No complete answer can be given in a few sentences, and perhaps my best plan is to proceed by examples, drawing inferences from the historical facts of medicine, which are open to the layman as well as to the doctor. The progress that has been made in this country during the nineteenth century comes within two overlapping periods. The first of these is the period of what may be called crude generalisations; the second is the period in which progress as to each disease has been based on the actual results of scientific investigation.

Motives of progress.—In the progress of the earlier period—and happily the same motives continue to be potent now—motives of philanthropy, panic, and economic necessity combined to secure, though too slowly, the needed sanitary reform. I cannot stay to discuss the high value attaching to the devoted efforts of such men and women as John Howard and Elizabeth Fry, of Sadler, Oastler, and their collaborators, of Lord Shaftesbury, of Charles Dickens, of Charles Kingsley, and in official life of Edwin Chadwick, of the Poor-law Board, who succeeded in arousing England and securing improvement in the conditions of work and life, and even of imprisonment; nor of such men as David Livingstone, who did so much to "heal the open sore of the world" constituted by slavery, to open up tropical countries and thus to prepare the way for the recent triumphs of tropical medicine. It is not without interest to note that the earliest successful attempts to enforce sanitation and to secure healthy conditions of work were in connexion with factory work. This involved the appointment of paid inspectors, introduced by the Act of 1833. Factory inspectors preceded medical officers of health and sanitary inspectors; and under the Home Office their beneficent work in industrial hygiene has, year by year, become more far-reaching and effective.

[1] Including loans of Metropolitan Water Board.

[2] Does not include Poor-law institutions or Metropolitan Asylums Board institutions

Next to philanthropy, panic has been, perhaps, the most efficient factor in early sanitary progress. So far as this country is concerned, cholera has been far from an unmixed evil. In 1831–2 it caused 41,544 deaths in the United Kingdom; and this led to spasmodic efforts on the part of many local boards of health to sweep the Augean stables of insalubrity. The lesson was not, however, sufficiently learnt until later epidemics of the same disease occurred, followed by the creation of local sanitary authorities, and the expenditure of large sums on schemes of water-supply and sewerage. The economic value of health and the wastefulness of premature sickness and death are not even now sufficiently realised; but the steadily increasing readiness of local authorities to expend money on sanitary measures indicates our increasing realisation of the truth that national health is national wealth.

THE DOCTRINE THAT DIRT MAKES DISEASE.

It was the great merit of the work of Edwin Chadwick that he added to philanthropy the important economic motive, showing through numerous local investigations the regular association between unhealthy conditions and disease, and the production of pauperism by means of disease. Of the value of this generalisation we are now fully advised. At least one-half of the total cost of pauperism in recent years is stated to be swallowed up in direct dealing with sickness, and to this must be added the indirect contributions of sickness, through deaths of bread-winners, and the host of by-products of sickness with which disease helps to populate our workhouses.

Chadwick was largely influenced by the teaching of Dr. Southwood Smith and his collaborators that epidemic diseases as a whole are the direct consequence of local insanitary conditions. This valuable generalisation, as we now know, needs a modified and more accurate statement, specialised for each individual disease. In its original form, however, it embodied a realisation of the immense power of the environment to make or mar the national life; it secured the beginning of our national improvements, and it laid the foundation of the house of health which as a nation we are building.

Typhus fever.—The value of the teaching of this doctrine is shown in the almost complete annihilation of typhus fever and the rapid decline in amount of enteric fever. The history of typhus is a romance in sanitation, from which the principles and practice of preventive medicine could be adequately taught. It occurred under conditions of dirt and overcrowding; but apparently it arose only by direct infection from person to person. It was spread, like small-pox, by vagrants from parish to parish, repeatedly brought by them from Ireland to England, and it was not brought under control until the migrations of vagrants had been limited, the sick had been segregated in hospitals from the healthy, "contacts" had been kept under adequate supervision, and the houses harbouring the disease had been disinfected and the vermin therein destroyed. In many instances the courts and alleys, the favourite lurking-places of the disease, were also swept away. Consider the following figures: In the ten years 1871–80, in Ireland, 7495 deaths were returned as due to typhus fever, in the three years 1909–11 the number had fallen to 143. In England and Wales, in the ten years 1871–80, 13,975 deaths were caused by typhus fever, in the three years 1909–11, with a much larger population, the number thus caused was 30.

Enteric fever.—The history of enteric fever is also very striking. In England and Wales in the 10 years 1871–80 78,421 deaths were ascribed to this disease; in the three years 1909–11 its greater population had 6447 deaths from the same disease, a number far too large, and in some measure due to the fact that some local sanitary authorities still do not realise to the full extent the importance of the generalisation that filth implies disease. The importance of this generalisation is shown by the excess of this disease in towns in which privy and ashpit systems continue and the water-carriage system of sewerage has not been installed. When our medical officers of health—the advance guard in our army of sanitation, and our advisers as to the best line of action—came to investigate the facts they ascertained that explosive epidemics of this disease are nearly always caused by specific excremental contamination of a public water-supply or of a milk-supply; and the knowledge of these facts conveyed to local sanitary authorities throughout

the country has induced them to expend enormous sums on public water-supplies and sewerage, and to the adoption of precautions in connexion with our milk-supplies. With more accurate knowledge of the methods of spread of enteric fever it became clear that the nursing of enteric fever under the home conditions of the poor involved further spread of the disease; and to the use of isolation hospitals must be ascribed a large share in the realised reduction of enteric fever, as also of typhus fever. In recent years it has been shown that there is a residuum of enteric fever not explicable by origin from the above-mentioned sources; and other smaller sources of infection have been traced, including chronic "carrier cases." Contaminated shell-fish, especially mussels and oysters, have been shown to be responsible for a considerable amount of this disease, and I have at the present time under consideration the issue of regulations which will give sanitary authorities additional control over this source of infection. There is reason to expect that enteric fever will ere long be known, in fully civilised countries, like typhus fever, scurvy, and leprosy, as in the main an historical curiosity.

STAGES IN REGISTRATION OF DISEASE.

The history of registration of disease is inseparably associated with that of public health, and it is convenient at this point to refer to this important subject. Until the ugly facts as to excessive mortality under conditions of filth and overcrowding could be persistently obtruded upon the public mind reform was difficult, sometimes impossible. The need of registration of deaths was realised as an instrument of sanitary progress—the epidemic of cholera in 1831–2 giving a great impetus in this direction—and political considerations aided its enactment.

It is not the least of Chadwick's great services to the State that he discovered William Farr, the humble apothecary, and placed him in charge of our national vital statistics. The series of reports issued by Farr have had an immense influence in promoting the public health. They threw the light of publicity on the towns and parts of towns in which fever and consumption throve, they enabled the moral of great epidemics to be pointed, and painstaking investigations into their causation to be made by medical officers of health and others. The later reports by Drs. Ogle, Tatham, and Stevenson have worthily continued the series initiated by Farr. In particular the decennial supplements have thrown valuable light on the incidence of industrial mortality. As time went on it became clear that registration of deaths gave a very imperfect view of the prevalence of disease, and that so far as infectious diseases were concerned valuable time was lost when preventive action could only be taken after the patient's death. Death registration told of the total wrecks which had occurred during the storm, it gave no information as to early mishaps enabling others to trim their vessels and thus weather through. It gave a list of killed in battle, not of the wounded also.

Progress occurred step by step, in our characteristic British fashion. Pioneer attempts were made by medical men in a number of districts to secure the voluntary notification of different forms of illness. The gradual failure of these attempts led to agitation in favour of the compulsory notification of the chief acute infectious diseases. Local powers for this purpose were secured by a few enterprising towns, in 1889 an Adoptive Act for the whole country was passed, and in 1899, by a further Act, the notification of these diseases was made compulsory throughout England and Wales. From time to time extensions of the list have been made by local authorities and by the Local Government Board; among the most recent additions have been the Orders by which the notification of poliomyelitis and cerebro-spinal fever has been made generally obligatory. It may be hoped that the more precise information thus obtained will throw new light on the conditions governing the spread of these serious diseases. In a large number of districts ophthalmia of the newly born is already notifiable, and I am about to issue an Order making this disease notifiable in every sanitary area, and enabling sanitary authorities to provide the prompt medical aid and nursing which are required to prevent this serious cause of blindness in childhood.

But you will, I think, agree with me that the most important extension of the principle of notification has been in regard to tuberculosis. The knowledge that this disease is communicable, and the importance, even apart from the fact of communicability, of having exact knowledge of its special haunts, and of its prevalence in different industries and among the poor living in crowded streets and courts, have enabled me step by step, by means of Departmental Orders, to apply the principle of compulsory notification to all forms of this disease. In order that public opinion might confirm the proposals, and to ensure that notification would be effective as well as merely prescribed, action was deliberately taken in stages. On Dec. 18th, 1908, an Order was issued, making obligatory from Jan. 1st, 1909, the notification of cases of pulmonary tuberculosis in Poor-law practice. This was followed on March 22nd, 1911, by an Order making the notification of cases of pulmonary tuberculosis in hospital practice obligatory from May 1st, 1911. On Nov. 15th, 1911, an Order was issued making it obligatory from Jan. 1st, 1912, on all medical practitioners throughout England and Wales to notify cases of pulmonary tuberculosis occurring in their practice, whether public or private; and on Dec. 19th, 1912, this duty was extended from Feb. 1st, 1913, to all forms of tuberculosis.

I have made careful inquiries, both from private practitioners and from hospital physicians, and have been much gratified to find that each step in the extension of notification has been welcomed by them, and that instances in which hardships to patients have occurred as the result of notification are very few indeed. This is due in part to the fact that notification is confidential in character, but also, and I believe chiefly, because the notification has not only enabled investigation of sources of infection to be made and precautionary measures to be adopted, but has also put the patient in the way to receive more efficient treatment. Tuberculosis is the one disease in which the fact that measures of treatment and of prevention are to a large extent identical is becoming fully realised, and the important endowment of the treatment of this disease in connexion with the National Insurance Act will enable local authorities and their officers to take active measures both of prevention and treatment on a larger scale than had been previously practicable.

During the last few years a weekly list of cases of certain imported diseases in foreign ports has been distributed by the Local Government Board to port medical officers of health, thus giving them warning of the points from which the importation of disease is particularly to be feared. By an Order of the Local Government Board, dated Dec. 13th, 1910, every medical officer of health has been required to send to the Board at the end of each week a list of the cases of the different infectious diseases notified in his area during the week, and during the following week a complete statement of these cases in each and all the 1800 sanitary areas in England and Wales is distributed by the Board, of which I am the head, to each of the medical officers of health of these areas for their information. For 1911 the first statistical return was prepared in my medical department showing the rate of sickness for each notifiable disease in every sanitary area, and by this means there is now accumulating a more accurate record of the sickness of each district than was previously possible. The influence of such information in securing investigation into the sources of disease and in enabling pressure to be brought to bear on reluctant or obstructive authorities will be very great.

No mention of notification would be complete which omitted reference to the Notification of Births Act. This Act has enabled medical officers of health to obtain the information as to births within 36 hours of their occurrence, whereas registration may be delayed for six weeks; and by this means early visits can be made in suitable cases by means of nurses or health visitors competent to give useful advice. I am hopeful that this Act will ere long be adopted in every sanitary area. Already it applies to more than half of the total population of England and Wales.

I must hasten on to make a few remarks on what I will call

THE SCIENTIFIC PERIOD OF DISEASE PREVENTION.

Historically, this cannot be separated from the earlier period of cruder, though most valuable, generalisations, in which already valuable work was being done by local sanitary authorities, under the guidance of their medical officers of health. The old generalisations, embodied in our warfare against overcrowding, uncleanliness, the herding of families in unsatisfactory houses, against impure water-supplies, against accumulated filth in and about the dwelling, against dusty occupations, retain their full value, and the warfare

against these evils still needs to be pursued with unabated energy. Each year, however, our knowledge of the causation of individual diseases is becoming more exact; and our warfare against disease can be pursued not only with what may be described as the bludgeon, but also with arms of exactitude not previously available.

Louis Pasteur.—The pioneer of this period, who showed the way along which you are now so successfully travelling, was one who was on the platform of the meeting of this International Congress in August, 1881, when last it met in London. He was then your most honoured member, and the immense possibilities of future prevention of disease opened out by him were already being realised. Need I say that I refer to Louis Pasteur, a name to be ever held in reverence as that of the father of scientific preventive medicine? Although himself originally a chemist, he has exercised a greater influence on medicine than any other man since Harvey. He succeeded in destroying the idea of spontaneous generation, and in establishing on a firm basis the germ theory of disease. As has been well said, he associated the faith of an apostle with the inquiring patience of a scientist. With indomitable courage he pursued his investigations, undeterred by obstacles and opposition. When his friends said to him, "Studies of that sort require much courage," his simple answer was, "What about duty?" It would ill beseem me as a layman to attempt before an audience of medical men, including our distinguished French *confrères*, to describe the work of Pasteur. I like to think of it especially as leading up to and inspiring that supremely important work of Lister which has revolutionised surgery and saved an untold number of lives.

Lister.—May I be excused for dwelling for a moment or two on Lister's work and its results? Born in 1827, in 1860 he became surgeon at the Glasgow General Infirmary, where, as elsewhere, the surgical wards were ravaged by erysipelas, pyæmia, and hospital gangrene. The introduction of ether as an anæsthetic by Morton in America, and the later introduction of chloroform by Simpson in 1847—although they prevented an enormous amount of suffering—had temporarily increased the mortality of surgery by rendering operations painless, and therefore more frequent, in wards in which septic infection prevailed. In those days suppuration was regarded as a normal process, now when it occurs as the result of an operation it is regarded as a grave reflection on the surgeon in whose practice it appears. Applying Pasteur's discovery that putrefactive fermentation is due to microbes introduced from without Lister, by antiseptic methods, without altered sanitation of his wards, so improved their record that in 1867 he was able to report that during the preceding nine months not a single case of erysipelas, pyæmia, or gangrene had occurred among his patients.

Listerism.—It is impossible to express statistically the saving of life and suffering effected through Lister's work, but its magnitude is well known to all of you. Operations which in former times were needed to save life were commonly followed by sepsis and death. A major operation for a compound fracture or other serious injury often meant merely the postponement for a few days of the fatal result. In many hospitals, and sometimes for long periods, each surgical patient in succession was liable to be attacked by erysipelas, pyæmia, or gangrene. Little wonder then that hospitals were regarded as death-traps, and an operation in the poorest home often had a greater prospect of success than a similar operation by a distinguished surgeon in our largest and best hospitals. The hospital and its architect were commonly blamed for this, and the fact that death lurked in the skin of the patient himself, in the finger-nails of the surgeon, and in the sponges of the nurse, was unrealised. Listerism has changed all this. It has done more. It has made possible triumphs of cure not previously dreamt of. Abdominal diseases and diseases of the brain and its coverings, formerly inevitably fatal, have come within the range of treatment, and the possibilities of saving and prolonging life have been immensely increased. The following comparison of the experiences of two of the largest metropolitan hospitals shows the greater extent to which operative assistance can now be given to patients. In 1878, 15·2 per cent. of the total surgical patients in these hospitals (4531 in number), and in 1911, 79·1 per cent. of the total surgical patients in these hospitals (6490 in number), received operative treatment. As a by-product of Listerism there has been an almost incalculable saving of pain, directly in connexion with the progress of injuries and operations, and indirectly in consequence of the number of painful conditions which can now be attacked by operative measures. We may, therefore, add the name of Lister to those of pain destroyers, which include also Morton and Simpson, the introducers of ether and chloroform respectively as anæsthetics, and the modern chemists who have introduced the wonderful series of drugs producing local anæsthesia.

Semmelweis.—From Listerism we may pass on to mention puerperal fever, a specially urgent case for the application of Listerism, an application which—if the teaching of Semmelweis had been appreciated—would have been adopted before Lister. As early as 1847 Semmelweis demonstrated that puerperal fever was caused in the lying-in wards in his clinic at Vienna by contact infection, brought by students who were also engaged in the post-mortem or dissecting-room, or in surgical wards in which there were open wounds. In 1849 Semmelweis's work was brought before a London medical society. Unhappily, its importance was not realised, and so the triumph of antisepticism and asepticism in midwifery was postponed; for the child-bearing mother the full realisation of freedom from risk of sepsis, which is a fair claim for every expectant mother to make, is still far from being realised. Our national figures show improvement in the death-rate from puerperal sepsis; a less improvement in regard to the accidents and diseases of pregnancy and childbirth. Even in regard to puerperal sepsis alone the record is not entirely satisfactory.

From puerperal fever and the accidents of childbirth—

In the ten years	1877–86	one mother died to	226	births.
,, ,,	1887–96	,, ,,	197	,,
,, ,,	1897–1906	,, ,,	228	,,
In the year	1907	,, ,,	281	,,
,, ,,	1908	,, ,,	280	,,
,, ,,	1909	,, ,,	270	,,
,, ,,	1910	,, ,,	281	,,
,, ,,	1911	,, ,,	262	,,

So far as London is concerned, I have recently authorised the admission of patients suffering from puerperal fever into the hospitals of the Metropolitan Asylums Board; and there is no reason why, with an improved service of midwives, better nursing, and the strictest asepticism in practice, puerperal fever should not become extremely rare.

Koch.—It is difficult to speak of tuberculosis without merely repeating the already familiar. In devoting a few minutes to this important disease, I wish to associate my remarks with the name of Robert Koch, who lifted our knowledge of this disease from the empirical to the scientific. Koch was one of many instances in medicine of genius triumphing over poverty. He was an obscure practitioner in a small country place, where he was able to demonstrate improvements of technique in bacteriology, which opened up a new epoch in this science. In 1882 he proved that tuberculosis is caused by the tubercle bacillus, and demonstrated the bacillus. He caused much searching of heart at the Congress in London in 1901 by his frank expression of opinion that bovine infection had very small importance in the production of human tuberculosis. More recent investigation has shown that bovine infection cannot be disregarded as a cause of tuberculosis in children; but his statement has doubtless led to greater concentration than there would otherwise have been, on measures to prevent infection from man to man. He steadfastly held to the view that tuberculosis in the main is a disease of the dwelling, more particularly of the bedroom.

I cannot express this better than in Koch's own words, uttered in his Nobel lecture in 1906:—

> The danger of infection becomes especially great when healthy people have to sleep in the same rooms with sick people, and even, as unfortunately still frequently happens among the poor, in the same bed. This kind of infection has struck attentive observers as so important that tuberculosis has been frankly and justly called a dwelling disease.
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> In Berlin during the last decade more than 40 per cent. of the cases of pulmonary phthisis died in hospitals. In Stockholm, too, the state of affairs must be very favourable in this respect. The number of patients that are thus placed in circumstances under which they can no longer infect is very considerable and cannot fail to influence the course of the pestilence.
>
> The improvement of the situation of the lower classes and the better knowledge of the danger of infection, the consequence of which is that

people no longer unwittingly expose themselves to it, have certainly helped to reduce tuberculosis. But I am firmly convinced that the better provision for patients in the last stage of pulmonary phthisis—namely, the lodging of them in hospitals, which is done in England and in Prussia to a comparatively large extent—has contributed most to the improvement. From this, however, we are to derive the lesson that the greatest stress is to be laid on this measure—namely, *the placing of cases of pulmonary phthisis in suitable establishments*, and far more care should be taken than hitherto that such patients do not die in their dwellings, where, moreover, they are for the most part in a helpless situation and inadequately nursed. If cases of pulmonary phthisis are no longer, as hitherto, rejected by the hospitals as incurable; if, on the contrary, we offer them the best imaginable nursing gratis and can even in some cases hold forth the hope of cure; if, moreover, their families are cared for during their illness, not the slightest compulsion will be necessary to induce a still much greater number of these unfortunate patients to go to hospitals than at present.

Factors in reduction of tuberculosis.—The causes of the remarkable reduction of tuberculosis in this and some other countries during the last 30 or 40 years cannot, however, be stated in a single proposition; and looked at from various standpoints diverse statements are possible, each containing a considerable share of the entire truth. In the three years 1909–11 tuberculosis of all parts of the body caused 151,137 fewer deaths in England and Wales than would have occurred had the experience of 1871–80 been continued. Comparing the percentage reduction for phthisis and for all non-tuberculous diseases in the aggregate for five yearly periods, from 1876–80 onwards, we obtain the following results:—

Percentage reduction (−) or increase (+) between—	Phthisis in males.	All causes, omitting tuberculosis in males.
1876–80 and 1881–5	−9·8	−6·2
1881–5 and 1886–90	−8·3	−0·5
1886–90 and 1891–5	−9·5	Unaltered.
1891–5 and 1896–1900	−8·3	−4·1
1896–1900 and 1901–5	−7·0	−9·0
1901–5 and 1906–10	−9·7	−8·8

It will be seen that there has been a fairly steady decline in the death-rate from phthisis, while the decline in the death-rate from all causes, excluding tuberculosis, has been irregular in amount, and only in recent years has approached that from phthisis. Improvements in housing, progress in average social conditions, higher nutrition, all have doubtless borne their share in bringing about this great reduction in tuberculosis. More cleanly habits of the people must be given a largé share in securing the result. The habit of indiscriminate spitting, although still prevalent, is much less so than in the past. The standard of domestic cleanliness has improved, and this must have cleaned out many of the former centres of infection. Even more importance must be attached to the diminished overcrowding of bedrooms. Overcrowding in bedrooms under all circumstances is liable to become a source of disease, still more so when sick persons are participants in the overcrowding. This being the case, there can be no hesitation in accepting the statement that consumption is spread largely in the bedroom, and that, as Koch has repeatedly pointed out, one of the most important means for stopping its spread is to prevent the sleeping of consumptives in the same bedroom, and still more important in the same bed as healthy persons.

A partial antidote to urbanisation.—In this connexion further stress may be laid on the fact emphasised by Koch that the reduction of phthisis in this country has been associated with a steady increase in the use of hospitals for the tuberculous sick. The use of these hospitals has not been directed to the segregation of the sick. Their use has formed part of the greater humanity of the nineteenth and twentieth centuries, and of the increasing demand for treatment of the sick under the most advantageous conditions. Incidentally, such increased expenditure on the hospital treatment of the sick has been made possible by our increased national prosperity; and a not very inaccurate index of national welfare in any country would be constituted by a comparative statement of its hospital provision. But let me state the facts for England and Wales. [A comparison of 1881 with 1910 in tabular form is given in the next column.]

In the country, as a whole, in 1881, one out of every nine deaths, and in 1910 one out of every five deaths; in London in 1881, one out of every five, and in 1910, two out of every five deaths occurred in public institutions. So far as phthisis is concerned, it is significant that in 1911, in the whole of England and Wales, 34 per cent. of the male and 22 per cent. of the female deaths, and in London 59 per cent. of the male and 48 per cent. of the female deaths from this disease occurred in public institutions. Inquiries at these institutions showed that the patients had usually spent several months in them prior to death. By this means, therefore, not only had the families of the patients been relieved of a serious burden, but also had been released from the risk of infection at a time when this was especially difficult to control.

In—	Percentage of the total deaths from all causes occurring in public institutions.			
	London.		England and Wales.	
	1881.	1910.	1881.	1910.
Workouses and workhouse infirmaries	13·1	22·9	7·0	10·9
Hospitals	7·3	17·6	2·8	7·5
Lunatic asylums	0·4	0·8	1·0	2·1
Total	20·8	41·3	10·8	20·5

The rapidly increasing urbanisation of our population must be remembered in connexion with this reduction of phthisis and increase in its institutional treatment. No fact is better established than that tuberculosis claims more victims out of a given number living in towns than in rural districts. In London the phthisis death-rate in males in 1911 was 1·68 per 1000 of population, being 1·50 in the aggregate county boroughs, 1·04 in other urban districts, and 1·32 in the aggregate rural districts. Now the proportion of the total population living under the relatively unfavourable conditions of town life has during this period of declining tuberculosis steadily increased. The proportion of the total population in England and Wales living in rural districts has decreased from one half to less than a quarter between 1851 and 1911. It is evident, therefore, that some important influences have been at work counteracting the effect of urban conditions as a whole on tuberculosis. Among these, important place must be given to the hygienic effect of the stay for months in an infirmary or hospital of a high proportion of the total consumptive population, at the most infectious and helpless periods of their illness.

At the present time the prospect of complete control over tuberculosis is more promising than ever before. Not only is public administration, with its magnificent past effect on tuberculosis, becoming increasingly efficient, but the National Insurance Act happily has given further important means of effective attack against this disease. The sanatorium benefit was necessarily confined to insured persons, with possible extension to their dependents. The capital grant of 1½ millions for the building of institutions for the treatment of tuberculosis was made for the entire community; and the further promise by the Chancellor of the Exchequer to contribute half the cost of schemes of treatment of tuberculosis—beyond the cost of treating the insured—for the entire community, has opened the way for complete schemes of prevention and treatment, which are now in process of gradual realisation throughout the length and breadth of the land. These schemes ensure early diagnosis, prompt treatment, and the removal of sources of infection, by adequately linked up measures of domiciliary treatment, and of treatment at dispensaries, hospitals, and sanatoria. When these schemes are matured, there will, it is believed, be no need for any patient to lack the means of treatment under the conditions best adapted to his welfare.

In giving these illustrations of what medicine and the sanitary service of the country have accomplished, my survey has necessarily been incomplete. Not only is there a marvellous record for typhus and enteric fever and for tuberculosis, but also for the diseases and accidents for which medical aid is required, and to a less extent for puerperal fever. A still more striking illustration could be found in small-pox, and even measles and whooping-cough in recent years appear to be losing some of their power

under the influence of the child welfare work which is gradually becoming systematised in many sanitary areas. The marvellous advances in tropical medicine are well known to all of you. Future generations will hold in gratitude the memory of Laveran, Manson and Ross, of Reed and Carroll, and of many others who are rapidly transforming the tropical countries, formerly known as white men's graves, into places in which the European can live with safety, if not also with comfort.

The saving of life in this country has not been confined to the diseases ordinarily regarded as preventible and curable. Even cancer, if only recognised and treated at an early age, and when accessible to the surgeon, loses a portion of its terrors; and it cannot be that the concentration on investigation of this disease in nearly every civilised country will fail during the next few years to add it, like tuberculosis, to the diseases doomed to insignificance if not actual annihilation. When the next International Congress of Medicine meets in London, who among you will be the hero to be honoured in regard to this disease, as Pasteur was honoured as the leader of a new era of preventive medicine when you met in this place in the year 1881?

With the discovery by Schaudinn of the spirochæta of syphilis, and with that wonderful application of chemistry to therapeutics which the genius of Ehrlich has placed at your service for the rapid treatment of this disease, we may hope for more systematic and universal treatment of syphilis, and the removal of one of the great cankers of humanity.

I have not time to speak of the improvement in infant and child mortality which has been realised in recent years, thanks in large measure to the active work undertaken by the officers of sanitary authorities, acting in coöperation with voluntary associations. Full details of this are given in a recent report issued by the Local Government Board, and the subject was fully discussed at last week's important conference, over which I presided.

Alcoholism and disease.—Nor can I linger for more than a moment over the improvement in regard to alcoholism which our national statistics reveal. Although in our national life vast sums of money are still wasted on alcoholic drinks, the amount is declining, and I cannot refrain from associating this fact in some measure with the declining death-rate from all causes in the aggregate, and more particularly with the declining death-rate among infants and from tuberculosis. The association in regard to infant mortality obviously is through the diminution of neglect and the improved standard of domestic life.

In regard to alcohol, the responsibility of the medical man is very heavy. The medical opinions of one decade are the popular opinions of the next; and for the inordinate belief in the dietetic and therapeutic value of alcohol is not the medical profession in some degree responsible? It is gratifying to find that this is now altered. The following figures from the excellent work on alcohol by Sir Victor Horsley and Dr. Sturge may be quoted. In 1862 the patients occupying 2254 beds in seven metropolitan hospitals consumed alcoholic liquids to the value of £7712; in 1902 the amount spent in connexion with 2309 beds in the same hospitals was £2925. In 1875 1405 patients were treated in the Wandsworth Union Infirmary, and the alcoholic expenditure was £371; in 1905, 5451 patients were treated and the alcoholic expenditure was only £2 7*s.* 5*d.* Again, during the year ended March 31st, 1912, the total expenditure on alcohol in the workhouses and infirmaries of the metropolis was £1743. Taking the average daily number of inmates as 50,900, this amounts only to about 1*d.* per inmate per week. My review of our indebtedness to medicine for public health progress would be incomplete did I not refer to the aids which biology and chemistry are now giving us in the diagnosis and treatment of disease, and to the important subjects of hospitals and of nursing.

THE APPLICATION OF SCIENCE IN MEDICAL PRACTICE.

The teaching of recent years is bringing home even to the man in the street the importance of all branches of science in relation to medicine. All knowledge sooner or later is pressed into the service of humanity, and it is therefore the bounden duty of the people, as represented by the Central Government and by local authorities, to give all practicable assistance, not only in utilising to the full extent our present knowledge, but also in extending its borders. The value of the X rays in the diagnosis and treatment of disease, the possibilities opened out by radium, the almost magical contributions of chemistry as illustrated in the work of Ehrlich and others, can only be mentioned in passing. Happily there are signs that medical research will be assisted by the State in future on a scale not previously contemplated; and in this connexion special mention must be made of the promise contained in the prospective expenditure in this country on sound and broad lines of the sum of some £58,000 per annum in connexion with the National Insurance Act.

Another branch of work in which research and scientific diagnosis are admirably commingled is exemplified by the splendid work which is now being done in the clinical laboratories by many of our large general hospitals. These laboratories provide facilities for the accurate and complete diagnosis of disease occurring among the poorest of the population which are as yet inaccessible to the vast majority of the total population, who are treated in their own homes. This limitation of valuable life-saving and disease-preventing work ought not to continue. I do not forget the fact that a large number of local authorities have provided facilities for the diagnosis of the three diseases diphtheria, enteric fever, and pulmonary tuberculosis. It may be hoped that in the near future it will be practicable to extend the work done in laboratories, and to make it available for the wider needs of general practitioners, thus enabling them to bring up their work more nearly to the level of that carried on in well-equipped hospitals. If this is to be secured it is essential that every medical practitioner should have the opportunity of utilising for every patient the best means for accurate diagnosis which modern medical science provides.

THE EVER-INCREASING INSTITUTIONAL TREATMENT OF DISEASE.

I have already spoken of the increasing extent to which the sick are treated in institutions. Although at first sight the connexion may not be obvious, I regard this as an essential branch of the subject of housing. If overcrowding is dangerous among those who are well, its danger is multiplied if the sick are commingled with the healthy; and it is almost certain that the universal excess of disease in town over country would have been much greater had it not been for the assistance given by the hospital to supplement domestic housing and nursing. It is not too much to claim for our hospitals that they have gone far towards removing the harmful effects of aggregation of populations in towns. Think, for instance, not only of the relief to the patients themselves, but of the easing of the burden borne by the overworked family, which is involved in the simple statement that in the year 1911 in the whole of England and Wales 24 per cent., and in London 47 per cent., of the total deaths from cancer occurred in public institutions. But I am speaking to those who, with the philanthropists, have rendered this supremely beneficent work possible, and who have in very large measure carried it out, and I need, therefore, only add a few figures which will make still clearer the enormous extent to which the home has been relieved by the hospital. I am indebted for these figures to "Burdett's Hospital Annual." In the United Kingdom there were in 1911, 49,854 beds in voluntary hospitals, or about 11 beds to 10,000 inhabitants, 80 per cent. of these being in daily occupation. The average stay for each patient was 25 days. These hospitals, including dispensaries, had in 1896 an income of £2,528,000, which in 1911 had increased to £4,185,000. The beds here enumerated do not include the much larger number in our workhouses and infirmaries, lunatic asylums, isolation hospitals, &c.

THE RÔLE OF THE NURSE.

The noble work of the medical profession in the treatment and prevention of disease would have been in large measure ineffective but for the devoted work of the nurse. In every age of the world there have been "born" nurses, but the "trained" nurse is a product of recent times. It is scarcely for me to sum up the qualities of the ideal nurse, but I may safely say that no amount of training will compensate if there is not also the tenderness of touch, the kindness of heart, and the desire to serve, without which the highest and best nursing cannot be secured. Personal experiences of many, if not of all of us, make us confident that paid service is not incompatible with the devotion and self-denial which

we associate specially with unpaid service, and without which skilled nursing fails in an important respect.

The history of nursing is bound up with that of Florence Nightingale. Until beyond the middle of the nineteenth century Sairey Gamp and Betsy Prig were scarcely exaggerated types of the hired nurse. But in 1851 Florence Nightingale entered the Deaconess's Institute at Kaiserwörth on the Rhine; and thus apparently the impetus for improved nursing in this country appears to have originated in a German charitable nursing institution. The great work of "the lady with the lamp" in the Crimea is well known. With courage and knowledge, and with inflexible discipline at the military hospital at Scutari she changed a seething mass of loathsome contagion and confusion into a cleanly organisation of sick patients. With the gift of £50,000 raised for her by a grateful public she endowed at St. Thomas's Hospital the first great nursing school in this country, and she thus founded our modern system for the training of nurses. The growth of the profession of nursing is among the most striking social facts of the last 30 years. As medicine progresses and becomes more exact the need of nurses to carry out the details of medical instructions becomes more clamant. In Poor-law institutions alone some idea of progress may be gained from the statement that in 1897 the total nurses employed numbered 4100; in 1907 they had become 6500; in 1911 nearly 7500; and in 1912 over 7600. For the voluntary hospitals complete figures are difficult to give, but the following figures taken from that valuable compilation, "Burdett's Hospital Annual," will give some conception of the magnitude of their work in institutions.

—	1911.	
	Number of occupied beds.	Total nursing staff.
A. Hospitals with medical schools:—		
Eleven London hospitals	4,031	2,055
Nine provincial hospitals	2,295	833
Five Scottish hospitals	2,511	848
B. Other general hospitals:—		
In London	970	368
In provinces	3,385	1,151
In Scotland	281	92
C. Special hospitals:—		
In the United Kingdom	2,027	736
	15,500	6,083

For every five patients in these institutions two nurses are provided, including day and night service. These numbers do not take into account the large number of nurses engaged in private nursing. Nor do they include the nurses whose work is even more closely associated than that of the institutional or private nurse with the prevention of disease. In London and the chief centres of population we have the Queen's Jubilee nurses, in many counties county nursing associations, and in nearly every parish a nurse who is engaged in helping the poor in sickness. This help does not consist solely in the valuable aid rendered at times of distress. Good district nursing also implies the teaching by example of methods of nursing and personal hygiene, which in the after-life of the assisted family are probably more valuable than the immediate aid. Did time permit, one might advantageously discuss the valuable work of female sanitary inspectors, health visitors, tuberculosis nurses, and school nurses, which is having important influence in reducing infant mortality, in preventing the spread of infection, and in securing a higher standard of domestic and personal cleanliness. But I must conclude my brief review of the progress of medicine and the work ancillary to it in relation to public health.

NATIONAL INTERDEPENDENCE IN RELATION TO HEALTH.

Your presence here to-day emphasises the international aspect of health. Rapid travel by land and water implies greatly increased possibilities of spread of disease. Happily, owing to inter-communication of information and improved administrative measures, precautions can more than counterbalance the increased possibilities of disease. News of danger can be transmitted by telephone, telegraph, cable, or wireless; a whisper is heard from one hemisphere to another, and so the benefits of intelligence and supervision can be universally shared. In other directions the possibilities of healthy life have been indefinitely increased. Our food is collected from all countries, and we send in exchange our manufactures, each country according to its special facilities or aptitude. Commerce and finance have formed a meshwork which covers the earth.

Medical knowledge in particular is cosmopolitan. Each country has brought its contribution. I have already mentioned the names of Pasteur and Lister, of Semmelweis and Koch, of Laveran, Manson, and Ross, and others. They stand out; but every great discovery has its background of smaller contributions to the common stock of knowledge without which no great achievement is secured; and every nationality has added its quota. So is it also with reforms. A reform in one country initiates or gives added impetus to efforts towards reform in other countries; and the tendency to follow becomes almost irresistible. In some countries it has already become a duty of civilised life to prevent anxiety as to the means of subsistence in old age; and so old age pensions have been inaugurated. In every country increased attention is being paid to the need to aid, when necessary, the widow to bring up her children; and insurance against accidents and disease is already in operation in Germany and in the United Kingdom. Every effort forwards is valuable, not only to the country immediately concerned, but also to every country; even mistakes by one nation add to one common stock of wisdom.

In no department of advance is cosmopolitanism so important as in regard to social reform, an important share of which consists in the development of the medical possibilities of improved health and well-being. The chief impediment to such reform is wastefulness, and one source of waste, expenditure on armaments, stands head and shoulders above all others. If this waste could be prevented gigantic sums would be released for the reforms waiting to be financed. The chief among these is concerned with the problem of poverty, and this problem will need to be attacked on an enlarged scale by removing the known causes of poverty, not merely by applying palliatives to its effects.

It is not too much to hope that this Congress will help to hasten the period of international peace and goodwill, earnestly desired by us all, in which our only rivalries will be in commerce, in progress, in science, and in the art of healthy and pure living.

LIVERPOOL ABATTOIR.—The question of the site of the abattoir at Liverpool is as far from settlement as ever. Half of the Love-lane site was sold the day after the city council decided not to buy it to the British American Tobacco Company for a large factory, which will give occupation to about 4000 people. The company are paying 30*s.* a square yard instead of 25*s.* a square yard, at which price the corporation of Liverpool had an option. There is still the scheme to put the abattoir at the Stanley cattle market outside the town, but apparently there is no haste to remove the crying evil from the centre of the city.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. E. Büren, of Solingen, Privy Sanitary Councillor.—Dr. A. Stratmann, of Wald, Privy Sanitary Councillor.—Dr. Th. Coulon, of Malmedy, Privy Sanitary Councillor.—Dr. J. Dallmann, of Furstenwalde, Privy Sanitary Councillor.—Dr. Bourget, professor of clinical medicine and internal pathology in the University of Lausanne.—Dr. Aguilar, professor of gynæcology in the University of Granada.—Dr. Gardner, formerly professor of mental diseases in the Cooper Medical College, San Francisco.—Dr. G. P. Head, professor of otology and laryngology in the Chicago Post-Graduate Medical School.

THEORIES OF IMMUNITY AND ANAPHYLAXIS.[1]

BY PROFESSOR A. BESREDKA,
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THERE is hardly any practitioner to-day who does not know of the malady called "serous" (serum sickness), with its clinical aspects so varied and sometimes so impressive and resultant. Its pathogenesis is still obscure on more than one point, which has not, however, at all impeded the treatment, above all preventive, from being already based on solid foundations. The facility with which hypersusceptibility to serum is brought about, or the anaphylactic condition, in the guinea-pig has allowed the various aspects of the problem which interest us to be examined deeply, particularly that regarding the toxicity of serums. This toxicity being of very great practical importance, naturally a start was made by trying to cause it to disappear in a direct manner. Setting out with the idea that the serum contains a poison, an attack was made upon this latter by the most varied chemical substances: permanganate of potash, alcohol, oxygenated water, chloroform, ferments, alkaloids, salts; but all these were employed without the least success. The only means that showed itself efficacious in suppressing the toxicity was heating the serum to 100° C. This process of heating the serums is not, however, practical—above all, when therapeutic serums are in question; as if, at the temperature of 100° C., the toxicity of the serums disappears, the same thing happens to their curative properties; this method, therefore, must be rejected.

We asked ourselves, however, if we could succeed, if not in completely suppressing the toxicity, at least in weakening it, by heating the serums to a moderate degree. Experiment has shown us that the toxicity decreases, indeed, progressively and in parallel with the temperature. It has shown us that, if the serum is heated only to 56° C. during four consecutive days, one hour per day, the toxicity is successfully reduced to a considerable degree; it diminishes, in fact, in this case, by about fourfold, without the curative properties on this account being sensibly injured. At the Pasteur Institute we are accustomed to heat the therapeutic serums to 56°C. four consecutive times, for an hour each time; this heating was originally done with quite another intention—namely, in order to guard against the contamination which is always possible in the course of manipulating serums. Now, without doubt, by this operation of heating, the serums were at the same time rendered decidedly less toxic, which has brought about the result that in France "serous" accidents have been at all times relatively rare; and in cases where they do happen (in about 13 per 100 of cases) they have not the grave character that they possess in countries where the serums are not heated. We must, however, recognise that the heating of the serum is only a makeshift; it is only a palliative, valuable it is true, but very insufficient in certain cases.

There exists, however, a method which not only leads to "serous" accidents being diminished but of entirely avoiding them; in order to do that it is necessary to operate not on the serum, but on the animal itself, in rendering it refractory to the second injection, which is the injection of critical trial. This refractory condition we can bring about in a transitory or in a durable fashion. Let us examine both cases. If it is true that the "serous" malady is to be attributed to the nervous centres we said, with M. Roux, that the anaphylactic shock should be able to be suppressed by lowering the nervous sensibility of the animal. Experiment has shown us, indeed, that when the guinea-pig is anæsthetised by means of ether, and when the animal's brain is injected, during the narcotic sleep, with a quarter of a cubic centimetre of serum, which is a certainly fatal (mortal) dose, no reaction is observed, and the animal wakes up safe and sound.

The same thing happens with alcohol. Let us take an anaphylactised guinea-pig and make it drink alcohol, or, indeed, rather let us administer alcohol per rectum by clyster. Let us leave it to sleep off the alcohol for one or two hours and wait until it returns entirely to its normal state. At that moment let us inject its brain with a lethal dose of serum. The animal will not react to it any more than a fresh guinea-pig—that is to say, it will not manifest the least trouble at all. This experiment shows, therefore, that in lowering the sensitiveness of the animal by alcohol the guinea-pig can be rendered refractory to the fatal injection of serum, and likewise also at least during the 24 hours following the absorption of alcohol.

In the same category we have observed (unpublished experiments) that a guinea-pig, sensitised to serum, which is injected with a subfatal dose of atoxyl on the eve of the injection of critical trial, resists this latter, whilst the control guinea-pig, prepared in the same circumstances, but whose sensitiveness has not been annulled by atoxyl, succumbed to the second injection of serum, accompanied by the classical symptoms. The same thing happens with anaphylactised guinea-pigs which are enfeebled by a prolonged fast (Lesné, Konstansoff). But apart from this refractory condition, fleeting and of short duration, a veritable immunity can be obtained, during a long space of time, by a quite different mechanism. Here we touch upon the problem so full of unexpectedness and so interesting to the clinician—that of anti-anaphylaxis.

When it had been established for the first time that a guinea-pig, sensitised to horse serum by a first injection, reacted to the second by exhibiting fatal symptoms in a few minutes, the first idea which came into the mind was that the serum contained a poison, and, indeed, a very violent one. It is thus that the phenomenon was interpreted, indeed, by the observers who were working upon "serous" anaphylaxis with the guinea-pig—by Rosenau-Anderson and Otto on one side, and by ourselves and our collaborator Steinhardt on the other. It was, indeed, so much the view of Rosenau-Anderson that these authors began by attacking the supposed poison of the serum by means of the most varied chemical reagents; then, when they saw that they had no successful effect at all, they set to work to vaccinate against this poison, and in order to do so they were led to do exactly as if they had to vaccinate guinea-pigs against a true toxin: they submitted their animals to a series of injections, each one being separated from the succeeding one by the regulation interval of six days, and each one comprising a massive dose of serum (5 cubic centimetres). After having thus made three or four injections they waited a further six days before proceeding to the critical injection. This critical trial not having brought about the death of the animal, they believed that they had thus achieved in reality the active vaccination against the poison of the serum.

It is in the same sense that we ourselves made our first attempts to obtain passive immunity. In order to confer passive immunity against the accidents of anaphylaxis, that is to say, against the poisoning by horse serum, we commenced by making in guinea-pigs a series of massive injections of this poison—that is to say, of horse serum; and when we judged that the guinea-pigs were rendered well immune we bled them and mixed their serums with the presumed poison in the hope of neutralising its effect. Our hope was not realised; the horse serum remained as toxic after this mixture as before. That might arise, we said, because the poison contained in the serum was one of those which did not readily afford antibodies. But while making this reflection we had some doubts; after all, we reflected, perhaps there exists no poison in the horse serum. While admitting even that it did exist, by what right did we wish to apply to anaphylaxis ideas borrowed from immunity, especially those relating to vaccination, active or passive?

Our doubts took more substance when, in an experiment, we saw that, in order to confer immunity against anaphylaxis, a single injection of serum sufficed, and not a series of injections at intervals, as in the process of Rosenau-Anderson or of Otto. At last, our doubts gave way to the conviction that Rosenau-Anderson, as well as Otto, were on the wrong track, and ourselves likewise, the day when we had established with surprise that from the morrow of the single injection of serum and even a few hours after this, the animal was thoroughly vaccinated against anaphylactic accidents. It was thenceforth certain that the hypothesis of the poison in the serum must be rejected and that the process of immunisation, such as was practised by Rosenau-Anderson, Otto, and as we ourselves practised it, collapsed.

[1] Abstract of a report on Antianaphylaxis to the Section of Bacteriology and Immunity at the Seventeenth International Medical Congress, translated for THE LANCET.

We were compelled to make a clean sweep of all we knew about vaccination and to examine a new chain of ideas. One thing remained acquired, that was, that in vaccinating the guinea-pigs against anaphylaxis in the same fashion as one vaccinates against a toxin, that is to say, in multiplying the injections and in giving them at intervals, Rosenau-Anderson and Otto put in train a technique which did not respond in any way to the purpose they had in view; we say even more, that that technique of vaccination goes entirely in the opposite direction, because, in multiplying the injections, instead of vaccinating the animal, it is sensitised. It is to-day a well-established fact, to wit, that the more the injections of serum are repeated the better the animal is sensitised.

We found ourselves therefore in the presence of an extremely curious phenomenon: a guinea-pig anaphylactised with horse serum, after having received a certain dose, non-lethal, of this serum under the skin, was found in a condition of being able to bear, some hours afterwards, one or even two lethal doses of serum. From the point of view of prevalent conceptions upon immunity it is an extraordinary fact which has no parallel in biology. Reduced to its most simple terms it is stated thus: A poison—admitting, until further pronouncement, that there is one in the serum—injected in a non-lethal dose preserves the animal against the assuredly lethal dose of this same poison, when this latter is injected one or two hours afterwards; in other terms, the addition of two doses of poison of which one is lethal, made at an interval of one to two hours, annihilates all injurious action of this latter; there is here a sort of phenomenon of interference which only physicists know of. Whatever may be, moreover, the intimate mechanism of this phenomenon, the fact in itself was certain, and our sole preoccupation was from that time to draw from it the greatest advantage. It is this phenomenon which was the point of departure of our process of vaccination by small doses and by subintrant doses; it is to the explanation of this process that we now pass.

In pursuing our researches on what we have called anti-anaphylaxis—that is to say, immunity against anaphylactic accidents—we have acquired the conviction that a vaccinating effect could be obtained with exceedingly feeble doses of serum, so feeble that they could pass unperceived by the animal to be vaccinated. We have seen, indeed, that the guinea-pig which is in full anaphylaxis tolerates without the least trouble a decidedly lethal dose of serum in the brain ($\frac{1}{4}$ c.c.) if it is previously injected, for example, with $\frac{1}{500}$ or even $\frac{1}{1000}$ c.c. of serum in the peritoneum—that is to say, with a dose which is from 200 to 500 times below the dangerous dose.

It is an important fact that this vaccination with feeble doses is extremely rapid; the effects take place in an hour or two, or even in some minutes, according to the individual case. Little doses of serum injected under the skin (1/20 c.c.) or into the peritoneal cavity (1/50 c.c.) act as veritable vaccines. According as the little dose of serum is introduced beneath the skin, into the peritoneum, the spinal canal, or the veins, anti-anaphylactic immunity is established with more or less rapidity. Thus with the guinea-pig it is reached, as a rule, four hours after the subcutaneous injection, and one or two hours after spinal or peritoneal injection, while it occurs almost instantaneously after venous injection, where the surprising rapidity with which the anti-anaphylactic state is established is most significant. We can thus take stock in quite a little time of a whole series of vaccinations, which we call "subintrant," and which confer immunity on an animal which can be tested in every way. Practically the little dose, which has just played the rôle of a vaccine, only retains efficacy against one or two lethal doses of serum. However, we come across cases where protection is required against several mortal doses, and it is then that "subintrant" doses are indicated. Instead of a single injection of serum we give two, three, or even four. At each fresh injection, at intervals of some three to five minutes, we increase the dose, and as each new injection increases the immunity of the animal a condition is reached of anti-anaphylaxis of remarkable persistence.

We have already pointed out that in France accidents with the serum treatment were rare, but this is no longer the case since we have begun to introduce the serum into the spinal canal. In Paris alone, to my knowledge, and at a short interval of time, ten deaths have occurred which can be put down simply to injection of the serum into the spinal canal. These cases will multiply if a remedy is not found, and this is the problem which we have attacked, by employing experiment, the only method which yields definite solutions.

In work done with Mdlle. Lissofsky we have shown that the classic symptoms of anaphylaxis can be reproduced by the intraspinal injections, and that with the guinea-pig these injections cause a shock indistinguishable from anaphylactic shock, but that as a rule the animal rapidly recovers, and only after an interval of one to five minutes do the typical anaphylactic symptoms begin to appear. As soon as we had proved that we could obtain with the guinea-pig anaphylaxis through the spinal route we attacked the problem of anti-anaphylaxis, and rapidly became certain that vaccination by little doses assured to the animal absolute immunity. Indeed, whatever be the method of vaccination adopted we can always preserve the animal against spinal anaphylaxis; the only tests to be observed are those which refer to the rapidity of the appearance of anti-anaphylactic immunity according to the method employed. The subcutaneous route is the slowest, vaccination by the spinal route is much more rapid. Experience shows that vaccination by this route induces anti-anaphylaxis in one to two hours at the most, twice as quickly at any rate as follows upon subcutaneous injection. But by far the most rapid method is intravenous, and not only is this method the quickest, but it is the most certain. The animal vaccinated in this way obtains absolute anaphylactic immunity in ten minutes or a quarter of an hour.

With regard to clinical practice, let me say first that the practitioner need not even inquire if the patient has already been injected. On all grounds anti-anaphylactic measures should be taken in each case where the serum treatment is employed, and every patient should be regarded as in a possible condition of latent anaphylaxis.

What, then, is the route to be chosen? It is dictated entirely by the condition of the patient. Let us consider a case of cerebro-spinal meningitis, for it is in such cases that we are most likely to have accidents. We are called to a patient with meningitic symptoms, but the diagnosis is doubtful, and injection is usually put off till to-morrow. In such a case do not leave without injecting 10 to 20 c.c. subcutaneously. It will not make the patient worse; on the other hand, if you decide on lumbar puncture the next day the patient will get full benefit, for he will be already vaccinated against anaphylaxis, and will be able to support immediately and easily 20 to 25 c.c. in the spinal canal. Take another case, occurring in the middle of an epidemic of cerebro-spinal meningitis, but the diagnosis is not doubtful. A spinal injection of 20 to 30 c.c. is decided upon. If it is not a very urgent case it is better to commence with an injection of 2 c.c., to let two hours pass at least, and then to inject the proposed 20 to 30 c.c. If the case is so urgent that each hour's delay brings, in the physician's opinion, added risk to the patient the venous route should be employed. The serum should be diluted, say, 5 c.c. in ten times its volume of "physiological" water. Of this, 1 c.c. should be injected into the basilic vein; four minutes later 3 c.c. of the same fluid can be injected; two minutes later 10 c.c.; after an interval of two minutes a final injection of 25 c.c. can be given. The patient can now be considered as vaccinated against anaphylactic risks. Clinical practice has demonstrated that he can receive ten minutes later an injection, intravenous or intraspinal, of 10, 20, or 30 c.c. of pure undiluted serum. These examples will enable the clinician to decide what method of anti-anaphylactic vaccination should be employed in each particular case. Whether in cerebro-spinal meningitis or any other malady he can rely upon the following times for anti-anaphylactic vaccination: Four hours subcutaneous, two hours intraspinal, and from ten minutes to a quarter of an hour intravenous.

What, then, is the mechanism? In 1907 in the *Annales of the Pasteur Institute* I wrote as follows: "Anti-anaphylactic vaccination when obtained by the peritoneal or cerebral route is probably a phenomenon of the same class as the disintoxication (*désintoxication*) of the tetanic brain by antitetanic serum performed *in vitro*. Vaccination thus reduces itself to dissensibilisation and would cause the guinea-pig to return to its primitive state, the

anaphylactic immunity being only the immunity that the guinea-pig normally possesses against the intracerebral injection of serum." Nothing need be added to-day to these words. In fact, since it has been perceived that the anaphylactised guinea-pig became vaccinated immediately, and that after one injection, it became plain that anti-anaphylactic immunity had nothing in common with immunities against microbes and toxins. Antitoxic or antimicrobic immunity is only produced in eight days or so at the least, its permanency corresponds to the number of injections, it is accompanied by the appearance of the antibodies in the serum, and does not protect against inoculations into the nervous centres. Anti-anaphylactic immunity, on the other hand, can be established by one injection, that is to say, that it is instantaneous, it is accompanied by the disappearance of antibodies, and extends its influence to the nervous centres of the brain and spinal cord. The single common point between the two immunities, otherwise so diametrically opposed, is their specificity. It is the desire to convey in one word all these characteristics, which are so much opposed to current ideas in immunity, that the term anti-anaphylaxis has been coined; and to avoid confusion the term should be strictly preserved for cases of rapid vaccination, perhaps with one single weak injection, perhaps with a series of "subintrant" injections, and following closely upon each other.

THE DOSIMETRIC METHOD OF ADMINISTERING CHLOROFORM.[1]

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THE principles involved in this method are: 1. Chloroform acts upon the tissues of the human body directly in proportion to the strength of its vapour contained in mixtures with air or other gases, or if it is in solution, in direct proportion to the strength of its vapour as given off by the chloroform and other liquids in which it is in solution—e.g., ether, alcohol, oil. 2. Its action is progressive in the sense that while the dilution remains constant, when administered for a prolonged period the resulting narcosis becomes deeper and deeper. 3. Its action is different in degree although similar in character when affecting different tissues of the body. Thus low percentages of its vapour—e.g., below 1 per cent.—do not produce anæsthesia but lower body temperature and interfere with metabolism. Higher percentages—e.g., 2 per cent.—induce anæsthesia, and if given for a prolonged period progressively lower blood pressure, and prejudice the function of respiration. 4. Ultimately chloroform acts as a protoplasm poison, first lessening function, finally destroying the power of functioning. Such effects vary directly as the strength of the chloroform vapour which enters the organism. 5. There is no reason to believe that the action of chloroform is capricious, but there is every evidence to show that it reacts more vigorously towards tissues which are abnormal, the pathological condition arising as the result of interference with the normal processes of life, e.g., the onset of asphyxia; or as the result of pathological conditions affecting the tissues of the organism, e.g., the blood, the organs, or congeries of organs or tissues, e.g., anæmia; diseases affecting respiration or circulation; fatty or degenerative changes in tissue cells, themselves the result of disease and producing a lessening in ability to perform a vital function. 6. There is a definite strength of vapour—i.e., a definite percentage—which will in all cases induce anæsthesia, while when this is transcended deeper narcosis results which involves detrimental interference with the functions necessary for life—i.e., circulation, respiration, and metabolism. 7. There is further a definite strength or percentage value of chloroform vapour which, when anæsthesia has been completely induced, will maintain anæsthesia without increasing the depth of narcosis. This percentage vapour varies inversely as the length of time during which the vapour is inhaled, being highest at the moment that full induction has been attained and gradually lessening in value until the end of the inhalation. 8. Both the values of the percentages requisite for the induction of anæsthesia and those needed for its maintenance, while possessing a maximum for the normal adult of average physique, are lower for individuals of impaired vitality and for children. This is more especially true of the values of the percentages requisite for maintaining anæsthesia when once produced.

The evidence that chloroform action is uniform and depends upon the strength of the vapour introduced is, that intact animals (Snow, Bert, Dubois, Clover, Lister, Waller) when inhaling vapours between 1 and 2 per cent. become completely anæsthetic. In the case of small animals Snow found that percentages of 1·7 and 2·9 interfered with respiration. His experiments allowed the periods of induction and maintenance to overlap, so that the lower percentage is probably in many instances the one which proved lethal through prolonged inhalation—i.e., maintenance. Further, his animals breathed in a restricted space, itself introducing other factors. Bert arrived at similar results. His maximum of safety was 2 per cent., and danger was constant when this was exceeded. In human subjects Bert habitually employed 1·6 per cent., and Dubois's experience coincided. In Bert's practice the patient respired from large gas-holders, while Dubois employed a plenum system anæsthetising machine, which materially increases the amount of the mixture entering the lungs, the dilute vapour being delivered under pressure.

The actual processes operative in bringing about anæsthesia, abeyance of function, and ultimately death, are known to some extent, but the extent to which chloroform passes from the pulmonary air to the blood stream it is at present impossible to gauge. Its passage appears in the main to be one controlled by the physical laws which govern the passage of gases through a membrane into a fluid, the gas-tension of which is below that of the gas in the space beyond the membrane. The red cells of the blood, acting as carriers, convey the chloroform to the cells of the tissues, and (Moore and Roaf) these aggregate the anæsthetic, with the result that biochemical function is at first lessened and ultimately ceases. Both by examination of inspired and expired air and of tissues and blood acted on by chloroform we learn that the degree of interference with function is directly proportional to the percentage strength of the chloroform introduced, although we do not know precisely what the percentage in the tissue cells may be.

Passing to gross tissues, Waller, in a series of most beautiful experiments, has shown that nerve becomes paresed, and later loses its conductivity, when exposed to a vapour of chloroform progressively increased in strength. A uniform result followed a known percentage strength of vapour, so that given precisely similar conditions in the case of nerve we can predict that any given percentage value of chloroform will produce a definite effect on nerve. The amount of hæmolysis following chloroform inhalation is difficult to estimate, as many factors of unknown influence exist in the case of human beings. In dogs this effect is slight (Buxton), greater when large amounts of chloroform are used. The experiments done *in vitro* are of little value. The outcome of a very large amount of work done upon the influence of chloroform upon the heart and circulation appears to be: blood pressure falls, the heart's action weakens, possibly in part due to dilatation (McWilliam), and the vasomotor control lessens directly as the percentage of chloroform which is in action. Although always tending in the direction indicated, these effects can be controlled while anæsthesia is persistent, provided the percentage of chloroform given is lessened *pari passu* with the length of time during which the tissues are being subjected to the influence of the drug, and that environing conditions remain constant. The onset of asyphyxial states, the occurrence of hæmorrhage or traumatic shock profoundly influence the effects. The introduction of oxygen exerts a restraining limitation, while its exclusion accelerates the chloroform effects upon the tissues. Further, normal blood protects tissues, while abnormal, whether through deficiency of constituent parts or owing to its containing some foreign and pathological constituents, renders tissues more vulnerable to the deleterious

[1] Abstract of a report read before the Subsection of Anæsthesia at the Seventeenth International Congress of Medicine.

influence of chloroform. A percentage of chloroform which entering normal blood will induce safe anæsthesia in one patient may bring about dangerous effects in another, if the state of his blood is vitiated by disease and especially by anoxæmia. Lastly, authorities, while differing slightly as to what height of percentage is the limit of safety, agree that double the anæsthetic dose of chloroform constitutes the lethal one.

Another point of importance, which has now been fully proved by the workers named above, is that chloroform affects tissues in the following order: Nerve tissues—the more highly differentiated being affected first; then heart muscle; later striped voluntary muscle; and subsequently involuntary muscular fibre—i.e., a low percentage will parese nerve tissue and myocardial fibres, while a far higher percentage is necessary to produce any effect upon voluntary or involuntary muscular fibres. In this fact lies the essence of anæsthesia; if it were not so the practice of producing unconsciousness by inhaling chloroform would be impossible. But as has been formulated above, this progressive effect of chloroform as regards various tissues is also progressive as regards various associated congeries of tissues concerned in carrying on the processes of life. There is no break in procession of events when chloroform enters the organism. One portion of the brain, the most highly differentiated, is thrown out of function when a certain percentage of chloroform is inhaled, and the tissues less sensitive reveal less effect; later, if the same percentage is inhaled the lower ganglia of the brain come under its influence and blood pressure falls while pulmonary ventilation suffers diminution and respiratory excursions grow more and more limited. Ultimately the nervous system becomes so much narcotised that it loses all power of function. At such an epoch the tissue life of voluntary and involuntary muscular fibre remains undestroyed. In the case of the tissue of the myocardium chloroform acts rapidly and early, for weighty evidence exists lending support to the view that the heart muscle soon loses its power of contracting and suffers acute dilatation.

Further, as regards the effect of chloroform upon the central nervous system, we are compelled to believe that some of its normal reflex mechanisms are affected, the effect being proportional to the strength of the chloroform vapour inhaled, in such a way that abnormally severe inhibitions are elicited, due to a hyperæsthetic state of the reflex centre. Embley has shown that with certain percentages of chloroform the vagal centres evince this increased activity, and that the effect of reflex inhibition under these conditions is to cause a heart standstill without the normal power for the organ to escape from inhibition. Yet a further example furnished by Bert's classical experiments shows the effects produced upon metabolism by chloroform. Dogs which were never rendered unconscious were found to die as a result of abeyance of the functions of metabolism.

It would then appear that even if we leave out of the question the massive effects—protoplasm destruction—produced by admittedly toxic percentages of chloroform, there is a very strong case in favour of believing that this anæsthetic produces effects which are directly determined both in their severity and the area over which they extend by the actual vapour strength which is introduced rather than by the actual amount of the drug which persists in the organism. I may be allowed, however, to indicate parenthetically that this storage of chloroform in the tissues is material to our present theme, although not so evidently so, since it determines the severity and possibly the nature of the sequelæ to chloroform inhalation. It may, and often does, produce a toxæmia, the prominent symptoms of which are tissue changes and tissue destruction; since the essence of a dosimetric system of administering chloroform consists not only in limiting the strength of vapour inhaled—first, to induce anæsthesia; secondly, to meet the actual requirements of the patient at every epoch of the operation, when environing circumstances challenge the necessity for change of dosage—but also in limiting the strength of vapour as the tissues become more and more under the influence of the drug in order to ensure the effect being one of a merely anæsthetic nature and not of the type of a toxæmia.

It may be said, and with some justice, that all drug action is a toxæmia, but I am using the term rather in the sense of a state brought about by destructive action upon the tissues by a drug, the symptoms of which state persist days or weeks after the elimination of the drug has been effected. Some workers have stated, relying upon experiments, that every person who takes chloroform is mildly poisoned, but may recover. This, so far as it is true, supports dosimetry in chloroform; as to its truth, that depends upon the careful scrutiny of the doses and methods employed in the experiments, a scrutiny which often reveals excess of vapour strength and viciousness of method involving extraneous factors—e.g., asphyxia, starvation, and so on.

Returning to the practical side of our question, it is convenient to consider the phenomena of the periods of (1) induction, (2) maintenance, and (3) recovery, including post-operation effects.

Induction.—Clinical experience supports the experimental results of Sherrington, Sowton, and others, that whereas the organism can be "taught" to tolerate even relatively high-percentage vapours if the strength is gradually reached, yet a sudden use at the commencement of an inhalation of such a strength results in collapse and probably death. When we are working out the physiological action of a new drug we use the utmost care to measure the strength employed. When our results are standardised we employ such and such a strength per kilo of body-weight and know that we shall in every case ensure a certain result which we anticipate. In the case of chloroform we have now standardised for the normal person that a strength of vapour somewhere about 2 per cent. will induce anæsthesia, that less will only cause sleep, while a greater strength will always lessen the activities of respiration and circulation, and may at any moment cause cessation of breathing and heart standstill. And yet in spite of this knowledge the methods most generally employed provide no means by which the administrator can even know the strength of vapour—i.e., the dose per kilo—he is giving, while he possesses no accurate control over the unmeasured and unmeasurable quantities of the drug employed. He is for ever experimenting upon his patients, and the results he obtains depend wholly upon his personal acumen as an experimenter. That he must frequently fail is foreordained, since in the problem which he seeks to unravel are factors of which he can possess no full knowledge. He depends solely upon his powers of observation; if the results consequent upon his unknown doses seem to be trenching upon the zone of danger he limits his supply of chloroform, but by how much he does not accurately know. Acquainted with the gross pathological changes obvious in his patient and the usual degree of trauma incident to any given type of operation, he nevertheless cannot gauge the more subtle tissue changes which make for resistive power to the "insult to tissue," or even to the strength of vapour which he is using, while he must always fail to anticipate the contingencies of shock and actual "insult to tissue" liable to occur in certain cases of difficulty. That many men can intuitively stumble upon a safe dose when employing undosimetric methods is obvious, and that experience will enable such to anticipate events is undoubtedly true, just as the pharmacist may guess his dose of strychnine or other potent drug; but the system lacks the imprimatur of science and is apt to fail at critical moments.

Maintenance.—These considerations bear equally upon the periods of induction and maintenance, but as regards the latter, another and equally important one arises. The patient who is safely anæsthetised and kept drugged throughout a prolonged operation may be, and often is, seriously prejudiced as to his recovery when an over-large amount of chloroform has been inhaled by him, even though his life has never been in obvious jeopardy during the administration. He is put into a state of chloroform toxæmia which directly interferes with his chances of safety and of achieving recuperation. With dosimetry, if accurate, he will have received the minimal quantity of the drug; at no time will his organism have been unduly depressed, and at the close of the anæsthesia consciousness will at once return and elimination will be practically finished. This aspect of the case is not sufficiently realised, nor is its importance recognised.

What, then, are the methods at our disposal to obtain dosimetry, and are we assured, on the one hand, that they are reliable, while, on the other, that in removing one set of dangers they do not introduce others?

Those in favour of dosimetry have sought to promote its ends by (1) an open method, with an elaborate system of dropping chloroform upon an absorbing and evaporating surface; (2) by mixtures; (3) by instruments which either present atmospheres of known strengths contained in

receivers, or by inhalers so constructed as to determine a more or less accurate commixture of chloroform vapour and air, the strength of which is at all times known to the administrator, and can be varied by him with the utmost accuracy.

In order to test these methods we need to establish certain criteria. These are, first, is there a maximum of dose common to all individuals beyond which a danger zone exists? There have been, and possibly still are, persons who consider that every patient is a law unto himself as regards chloroform, and this can only be decided by testing him; hence they desire as pliant a system of administration as is possible. I think, however, that the evidence is all against such a view, and so it must be abandoned if any scientific concept of the administration of chloroform is to be adopted.

The actual maximum of the percentage of chloroform vapour consistent with safety has been experimentally fixed at 2 per cent. for induction, but some authorities regard this as too low for the requirements of the type of operations usual at the present time. It is not strictly within the purview of my subject to discuss this point, since whatever dosimetric apparatus is in use it can be graded to the required limits. It seems, however, substantially proved that the 2 per cent. limit is generally correct for all cases. When this limit is exceeded to obtain a more profound narcosis, it always carries the patient into the danger zone, being associated with a perilous fall of blood pressure and depression of the respiratory and heart centres.

Snow, Clover, the late Lord Lister, Waller, Levy, and others have shown conclusively that a drop method can be arranged which gives approximately a definite strength at the outset of the administration, but this is obtainable only by the utmost skill and experience, and only when such disturbing factors as the patient's irregularity of breathing, i.e., variations in depth and rhythm, room temperature, limitation of the "spread" over the evaporating surface, and prevention of air currents can be eliminated. Such an arrangement possible under experimental conditions is not attainable in everyday practice. Besides this fact the method is open to the danger that it presents no automatic limitation of the strength of vapour in use, and provides no means by which the administrator can ascertain what is the actual strength he is employing.

As regards mixtures, the same objections exist, with the additional one that, owing to the difference in the boiling-points of the ingredients, it is impossible to obtain anything like an accurate percentage value for the chloroform which is being given off.

Passing on to the mechanical inhalers we may note that Bert's method of mixing chloroform vapour in air in large receivers, although fairly exact, is unsuitable for routine employment, and, further, does not allow of the necessary variation in the percentage. It has passed out of use. We have at the present time a considerable accumulation of clinical experience bearing upon the employment of dosimetric inhalers. More or less exact regulating inhalers which are fairly compact have come into use, and many persons have been anæsthetised by their means: Snow's, Clover's, and the Roth Dräger apparatus permitted a higher percentage than 2 per cent., and the means by which the percentage is lessened is inexact. With all of these deaths occurred during their use, owing to the 2 per cent. strength being exceeded. The regulators of Dubois, of Waller, and of Alcock are exact, and are constructed upon the plenum system, which renders breathing easy. These have given excellent results, although from their bulk they are more adapted for hospital than private use. Among "draw over" inhalers the Vernon-Harcourt has received the widest publicity and has been most employed. Dr. Levy's inhaler is on similar lines, but permits a maximum of 3·5 per cent.

My own experience is chiefly with the Vernon-Harcourt regulator, and although I have used most of the other forms I propose to speak mainly of this regulating inhaler. Its maximum is 2 per cent.; however, by using an increase tube, an undesirable addition, it is possible to produce 2·5 per cent., or, indeed, any percentage if the inhaler is specially graded for it. My experience, now extending over nearly 10 years, has convinced me that, provided an accurate technique is practised, 2 per cent. need not be exceeded. Very muscular and very obese subjects take a longer time to go under, and when time is an important matter, as in hospital work, a rapid induction with nitrous oxide and ether preceded by an injection of gr. 1/100 of atropine is often serviceable. I employ oxygen with the chloroform, not because the patient has any difficulty in breathing, or becomes cyanosed when this inhaler is in use, but because I am convinced that oxygen by maintaining the vigour of the tissues is a safeguard under any form of anæsthesia. Oxygen also lessens shock and counteracts the tendency of the tissues to weep when large areas are incised or denuded of their covering. The failure to produce complete anæsthesia with a 2 per cent. vapour is usually if not always the result of badly fitting masks or unskilled handling, so that although the machine registers 2 per cent. the actual percentage inhaled falls short of it. The use of a flanged mask lessens the danger of leakage. In some surgical operations deeper narcosis than the third degree—i.e., anæsthesia—is called for by the surgeon. When this is so the use of a dosimetric inhaler is more than ever desirable, since the danger zone is entered, and the anæsthetist requires a scientific instrument which enables him to control the higher percentage, increasing it at critical points in the operation and lowering it when these are passed. At all events, he knows exactly what percentage he is employing, and retains absolute control of the anæsthetic.

It is alleged that dosimetric inhalers introduce an asphyxial element, and, further, that they are inapplicable for many types of operation. These statements, however, arise from misapprehension or from lack of experience of the method. Cyanosis does not ever occur as a result of using an inhaler; when it arises it is due to preventable complications such as the faulty position of the patient, allowing fluid or other foreign material to occlude the airways or permitting the jaw to drop. Any of these possibilities may arise whatever method of giving chloroform is in use, and are so well known that any expert anæsthetist will foresee and guard against them. The dosimetric inhalers in common use are supplied with nasal and mouth tubes, and the definite percentage vapour can be either inspired by nasal tubes from a Vernon-Harcourt inhaler, for example, by Crile's method for operations about the buccal cavity, or can be propelled by a hand-pressure ball or foot-bellows similar to the plan adopted when a Junker's bottle is in use.

I may add that since adopting the dosimetric method I have seen fewer complications, and have been enabled to safeguard patients from chloroform collapse. The appearance of a patient after even a prolonged inhalation of chloroform, when a dosimetric method has been employed, is in striking contrast to what is seen when unstinted quantities of the drug have been inhaled. The one is of almost normal colour and suffers few after-effects, while the other is pale, drawn, vomits, and is collapsed to a greater or less degree. It is the difference between chloroform acting as an anæsthetic and chloroform acting as a tissue poison—between anæsthesia and toxæmia. The technique is too well known to need detailed description.

In conclusion, then, I may say that I believe, both from experimental and clinical evidence, dosimetric methods of giving chloroform are the only safe means of exhibiting that drug, and by their use its dangers are abolished or so far lessened as to be negligible.

New Cavendish-street, W.

UNIVERSITY OF LONDON.—At a recent election of chairmen of committees Dr. S. Russell Wells was elected chairman of the council for external students, Sir Alfred Pearce Gould chairman of the Brown Animal Sanatory Institution Committee and of the Graham Legacy Committee, and Dr. W. P. Herringham chairman of the Site and Accommodation Committee. Dr. T. Buzzard has been reappointed representative Governor of the Westminster Hospital Medical School. Professor A. D. Waller has been re-elected director and Dr. T. L. Mears treasurer of the physiological laboratory. Under the Dixon Fund a grant of £150 has been made to the Brown Institution for researches into leprosy, Johne's disease, and toxins and antitoxins to be carried out by the superintendent, Mr. F. W. Twort, or under his supervision, and £10 have been granted to Mr. J. W. McLeod, assistant lecturer in pathology at Charing Cross Hospital, for researches into streptococcal toxin. Mr. S. H. Warren has been appointed Graham Scholar in Pathology for the sessions 1913–14 and 1914–15.

INFECTION OF THE URINARY TRACT IN CHILDREN BY THE COLON BACILLUS.[1]

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THE following remarks are founded mainly on the observation of 71 cases of various types of acute bacillus coli infection which have been under my own care. It is scarcely ever possible to decide in any individual case which route the bacilli take in passing from their original harmless position to where they ultimately set up disease. It is, however, quite certain that they are sometimes carried there by the blood-stream, sometimes pass in by the lymphatic channels, and sometimes ascend from outside by the lumen of the urinary tract. I would especially emphasise the great probability that the organisms often follow a combination of these paths in seeking their destination.

Predisposing influences.—When the bacilli reach the urinary tract their fate varies according to circumstances. Generally, in all probability, they are either washed out immediately by the urinary stream or else destroyed in the tissues or in the normal urine; or they may remain for a time doing little or no harm. The normal colon bacillus seems to have little pathogenic effect on healthy mucous membranes. Had it been otherwise the female urethra would surely not have opened so close to the anus. If the virulence of the organisms has been increased by morbid processes in the intestine or otherwise, or the normal resistance of the tissues lowered by local or general disease; or, perhaps, if there has been some retardation of the flow of urine, so that the bacilli have been retained abnormally long in contact with the tissues, then more or less violent inflammation, with corresponding symptoms, may be set up. The clinical histories, therefore, very often (32 times out of my 71 cases) give a definite account of the symptoms of the urinary disease having set in during, or shortly after, some sort of weakening disease or experience. In three-fourths of the cases in which such a predisposing ailment is noted it is of the nature of bowel disturbance. The analogy of adult cases leads us to believe that any cause which retards the downward passage of urine will predispose to bacillus coli infection. Cases of congenital hydronephrosis and dilated ureters, with hypertrophy of the bladder, are extremely apt to be infected in this way in the early days or weeks of life. In fact, if we find much pus, with colon bacilli, in the urine of a baby of a few days old, and can make out on palpation an enlarged and thickened bladder, we are justified in diagnosing congenital hypertrophy of the bladder with dilatation of the upper urinary passages.

Clinical features. Age.—The disease may begin within the first few weeks of life, and is about twice as common in children under two years as it is after that age; and it is also, generally, much more severe in the younger children. Occasionally, however, it presents its severest and most typical forms in later childhood. As a rule, when the disease occurs in infancy, the boys are affected at a much earlier age than the girls. There is a type of extremely chronic and intractable case which is almost, if not entirely, confined to later childhood. These cases generally begin after an acute illness—mostly measles; and many of them turn out to be tuberculous.

Sex incidence.—The relative proportions of the two sexes affected, and the ways in which the clinical details differ in boys and girls, are among the most striking features of this infection. An analysis of these differences might possibly throw some light on the course of the infection. The following are some of the points. 1. In all the lists of cases which have been published the number of girls is much larger than that of boys. Among my cases the girls formed 79 per cent. 2. In young infants, as Thiemich has pointed out, the illness begins more often with diarrhœa than in older children. We also find that the diarrhœa is more frequently a marked symptom in boys than girls. In other words, "primary" cases of acute pyelitis—i.e., cases setting in during apparent good health—are commoner in girls than in boys. 3. Further investigation shows that during the first six months of life far more boys than girls were affected, although after the sixth month girls largely predominated. When we take a larger number and analyse the ages and sexes of 224 babies under 2 years taken at random from 13 authors, we find that, although the numbers are less striking, there is still a considerably greater proportion of boys during the first six months than at any later age. 4. The extreme rarity of rigors at the onset of the symptoms in boys is noteworthy and interesting when compared with the frequency of this symptom in girls. In none of my 15 male cases was this symptom ever noted at the outset, although it was always specially inquired about. Among the records of 52 cases of bacillus coli infection in boys of 2 years old and under I have only found the occurrence of a rigor mentioned in one or two instances, while in girls it is very common. 5. Mild cases of bacillus coli infection are rare in boys in my experience. In male patients the attacks of pyelitis are apt to be severe, and there is usually in them a much larger proportion of cases of fatal pyelonephritis than among girls.

The significance of these clinical differences between the sexes is not quite clear, but the great preponderance of female patients seems, as is generally admitted, to force us to the conclusion that ascending infection by way of the urethra must be a common occurrence; and the excess of girls over boys probably represents the frequency with which urethral infection takes place. It seems very unlikely that the colon bacilli can find their way up the lumen of the male urethra. The greater prevalence of antecedent diarrhœa in boys would probably cease to exist if we were able to subtract from the list of girls the primary cases infected per urethram.

The frequency of pyelonephritis in the male sex may be explained by the infection having usually in them passed straight from the bowel to the kidney and pelvis, and not having ascended from below. The facts that rigors are so very rare in acute pyelitis in boys, and in pyelonephritis in both sexes, while they are so common in acute pyelitis in girls (in whom we suspect an ascending infection), suggest the idea that the ureters may be the particular portion of the urinary tract from irritation of which a rigor most readily arises. The frequency with which rigors are met with in ureteral calculus may be held to support this view.

Symptoms.—These depend on the severity of the inflammation and the part of the tract affected. When the disease has not spread beyond the bladder it is often impossible to recognise any symptoms at all, apart from the pus and bacteria in the urine, especially if the children are already ill at ease from intestinal or other disorders. Sometimes, however, careful questioning will bring out a history of increased frequency of micturition, with uneasiness or pain during the act, and perhaps also of some hæmaturia or of an offensive odour in the urine. There is little or no pyrexia. Much the most important cases of this infection are those in which the parts above the bladder are invaded—pyelocystitis, pyelitis, and pyelonephritis—and the striking peculiarity about their symptoms is the trivial and equivocal nature of the local manifestations and the extreme severity of the general disturbance—acute distress, prostration, fever, &c. In a few of these cases one finds the early symptoms those of cystitis only, and then the temperature runs up suddenly, often with a rigor, and the clinical features of pyelitis develop. In others, symptoms of pyelitis set in obscurely, while the child is very ill with bowel disturbance. Very often, however, the symptoms which we associate with acute pyelitis begin suddenly in the midst of apparent good health.

The temperature rises rapidly, often reaching 103°–105° F. or even higher, and frequently assuming a remittent type which recalls that of a typical enteric fever. This may go on for many weeks with or without marked periods of intermission, but under alkaline treatment the pyrexia generally ends by crisis within 48 hours, although in about half the cases the temperature tends to rise again a few days after. The frequency of well-marked rigors in young children with acute pyelitis is interesting, because rigors from any cause are so very rare at this age. I do not remember ever having seen an infant under two years who had had a well-marked rigor and who had no pus in the urine. Vomiting occurs in more than half of the cases of acute pyelitis, especially during the first few days of the attack.

[1] Abstract of a report read before the Section of Diseases of Children at the Seventeenth International Congress of Medicine.

The extreme misery, restlessness, and general tenderness from which these children suffer when their temperature rises form valuable and important diagnostic signs. They are drowsy and often delirious, and if they are very young infants they frequently squint. The respiration-rate, compared with that of the pulse, is often considerably quickened, although the respiratory organs are unaffected. In many cases there is a great disinclination for food, and even for fluids. The local symptoms are either slight or apparently quite absent. Indefinite colicky pains may be present, but the children are so irritable that the exact distribution of any tenderness that is present is often difficult to ascertain. Frequency of micturition is common, usually at the onset of the illness. In older children dysuria is much more likely to be troublesome than in infants. I have never found well-marked vulvitis or vaginitis.

The microscopic and chemical features of the urine are much the same, whether the case is one of simple cystitis, pyelitis, or pyelonephritis; but in pyelonephritis there is rather more albumin present than in pyelitis or cystitis, and a few tube-casts may sometimes be found. Little or no help is to be expected from the character of the epithelial cells found in the urinary deposit. The urine on passing usually looks slightly cloudy or opalescent, is distinctly acid, and contains a considerable number of pus cells and bacilli of the colon group. On standing it remains cloudy for a long time, and a definite deposit is slow to form. Although the urine generally shows a marked acidity when it is passed, the reaction changes rapidly on standing, and in time the urine becomes alkaline. On microscopic examination of the urine the pus is rarely large in amount. In coli-pyelitis there is often no pus to be found when the temperature first goes up. Sometimes the pus varies greatly in amount on different days, and may even disappear for a day at a time.

The differential diagnosis of acute coli-pyelitis depends on: (1) the presence of pus and colon bacilli in the urine along with the above severe general symptoms; and (2) the absence of any signs of organic disease outside the urinary tract which could account for the condition. A diagnosis of the exact distribution of the bacillus coli lesions in the urinary tract cannot be made with any approach to accuracy if the patient is a young child. Roughly speaking, patients who have pus and colon bacilli in an acid urine, with no rise of temperature and little or no distress, usually have cystitis only; remittent pyrexia with great general misery signifies pyelitis; while severe collapse with or without pyrexia often indicates a grave implication of the kidney. If a case of bacillus coli infection with high fever, which has been diagnosed as acute pyelitis, undergoes alkaline treatment thoroughly, and does not show a considerable fall of temperature within 48 hours of the urine having become alkaline, this signifies that the kidneys are badly affected.

Treatment.—In ordinary acute cases the first indication is always to ensure a free discharge of urine, usually by giving large quantities of fluid to drink. If the patient refuses to drink enough, the fluid must be administered through a stomach-tube or by the rectum. The second indication is to see that the bowels move adequately. The best drug for this purpose is probably sodium phosphate, because it helps in the alkalinisation of the urine. An occasional dose of calomel is also often beneficial.

The other important forms of treatment are: (1) *alkalinisation of the urine;* (2) *administration of antiseptics;* and (3) *the use of serums and vaccines.* The aim of the alkaline treatment is to render the urine alkaline, and to keep it so for a week or two after all the pus has disappeared and the signs of uneasiness have ceased. Although I have generally used potassium citrate for this purpose, other alkaline salts would probably prove equally efficacious if given in sufficient quantity. The dose of potassium citrate necessary varies considerably in different cases. The smallest amount which I have ever found successful in a severe case of coli-pyelitis was 24 gr. (1·55 grm.) in the day, in a girl aged 10 months. Generally one should begin with 60 gr. (3·88 grm.) if the patient is under 2 years old, and it will often be desirable to give double this amount. Occasionally 150 gr. (9·7 grm.) or 180 gr. (11·6 grm.) in the day has to be given before the urine becomes definitely alkaline and the temperature falls. Sometimes large doses set up diarrhœa; and when this is the case the neutralising effect on the urine is necessarily weakened. Occasionally the urine becomes alkaline within a day or two after beginning the treatment; generally in four or five days; rarely six or seven days, but never longer. The effect of the alkaline treatment is best estimated by studying the temperature charts; because, when the fever lessens, the other symptoms practically always improve. The fact that great benefit follows the alkalinisation of the urine in acute cases of bacillus coli infection of the bladder, ureters, and pelvis is, I think, quite established. How the treatment effects this, however, still requires investigation.

Antiseptics given by the mouth may act beneficially in two ways. In the first place they may lessen the infected state of the urine by their bactericidal action in the alimentary canal. In many cases of pyuria from bacillus coli infection a dose of calomel is followed by a distinct temporary improvement. The disinfectant action of the mercury in the intestine apparently improves the state of the urine by lessening the number of bacteria which are leaking into it from the bowel from time to time. Salol, in doses of 2 to 4 gr. (0·13–0·26 grm.) three or four times a day, is certainly often helpful. I have found it of most use when given in addition to alkaline treatment, especially in the later stages. Urinary antiseptics, such as urotropine and its various derivatives, which act directly on the bacteria by liberating formaldehyde in the urine, have proved of great value in the treatment of urinary infection by the typhoid bacillus and certain other organisms. They are, however, disappointingly ineffectual in most cases of colon bacillus infection.

Of the serum treatment which has been found successful by Cacioppo, Comba, Dudgeon, and others, I have had no experience. Vaccines I have used in a few cases, but with disappointing results. In the hands of others I have known them occasionally quite successful in acute cases, especially in older children.

Edinburgh.

THE CLINICAL APPLICATIONS OF PATHOLOGICAL CHEMISTRY.[1]

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IN discussing the clinical significance or usefulness of pathological chemistry one naturally turns first of all to the urine, for urine has been the field of innumerable investigations under all possible conditions. It must at once be admitted, however, that the clinically useful contributions obtained by urine analysis have not been very numerous. It has been chiefly a matter of finding and determining a few urinary constituents which do not occur in health, such as albumin, sugar, and the acetone bodies. Metabolism disorders causing or accompanying diseases do not necessarily or usually result in any pronounced alterations in the amounts of the ordinary normal urinary constituents. Even in the case of gout, which is distinctly associated with uric acid, it is an extremely difficult matter to prove by means of urine analyses that the uric acid elimination is not entirely normal. And if it had not been for the fact that uric acid, because of its insolubility, is so easily found in the joints, it would unquestionably have been a very long time before any definite relationship between uric acid and gout could have been established. The elimination of the normal metabolism products does not necessarily give any clue to the extent to which they may be associated with diseases. Their formation is probably such an integral part of the continuation of life as to persist practically undiminished even in diseases which are essentially metabolism diseases, and being formed they are eliminated, and must be eliminated, substantially the same as in normal persons, or death will result in a very short time.

Of the four chief nitrogenous urinary constituents—urea, creatinine, uric acid, and ammonia—the last two have become important from the clinical standpoint. The discovery of the abnormal elimination of ammonia in acidosis represents a brilliant contribution of biochemistry to clinical medicine. Urea, water, and chlorides have become important factors requiring consideration in the study of nephritis.

[1] Abstract of a report made to the Subsection of Chemical Pathology of the Seventeenth International Congress of Medicine.

In the case of urea, it is to be noted that it is only within the last decade that we have begun to understand its true relationship to protein metabolism and to the other nitrogenous waste products. We are now reasonably sure that urea is not an oxidation product of the nitrogenous materials. The animal body is not capable of oxidising the amino groups contained in nitrogenous materials taken as food, and the urea formation, as I look at it, is perhaps the most important mechanism for preserving the neutrality of the body fluids. If it were not for the urea formation the body fluids would become loaded with ammonia. The urea represents, therefore, chiefly a metabolism of superfluous nitrogen in the food, and tells us nothing concerning the oxidations of the remaining carbonaceous residues derived from the protein material. Except in the case of certain rare and unusual "inborn errors of metabolism" the urea formation is persistently normal, however much the urea elimination may vary because of normal or pathological variations in the total nitrogen metabolism. The urea nitrogen in urine may represent anywhere from 50 per cent. to 95 per cent. of the total urinary nitrogen, the proportion depending chiefly on the relative proportion of the food metabolism to what has been called the tissue metabolism.

The illusion which persisted so long with reference to creatine and creatinine in urine represents a striking illustration of how important facts of metabolism remain hidden for want of suitable analytical technique. We know now that these two products do not occur in miscellaneous varying proportions in human urine. We know that creatine, for some unknown reason, is normally found in the urine of children in relatively large amounts, while in urine of normal adults there is usually scarcely a trace of creatine. We also know that creatinine in the urine of adults is practically independent of the protein in the food, that the amount eliminated depends on the size of the person, and that in diseases creatine is also frequently found in the urine of adults. Nothing definite is as yet known concerning the creatinine output in abnormal metabolism except that in fevers and other diseases there is an increase, sometimes a very large increase. It is to be noted that we are as yet entirely ignorant of the origin and significance of the creatine which is so abundant in muscles, and it is scarcely to be doubted that fundamentally important metabolism problems somehow are connected with the muscle creatine and urinary creatinine, but these are as yet problems of normal metabolism, and it is too early to say whether or in what way light may be thrown on clinical problems by studies of these products. The fact that the muscles of mammals, including man, contain 0·3–0·4 per cent. of creatine and only traces of the chief nitrogenous waste product urea constitutes to my mind strong presumptive evidence that creatine serves some important function, and it is quite conceivable that metabolism diseases of one kind or another may be associated with this curious substance.

In urine analyses we determine the products which have been eliminated. In the study of the essential facts of normal metabolism urine analysis has rendered valuable service, because in normal persons waste products do not accumulate in the body. In diseases, however, the situation may be quite different, for while waste products may be eliminated in amounts so nearly normal that we cannot detect any deficiency by urine analysis, there nevertheless can be serious accumulations of products within the body. The primitive notion about "impure blood" has a kernel of truth in it, and by chemical analysis of blood it is now possible to reveal clinically important facts.

The blood of normal human adults contains from 22 to 30 mg. of non-protein nitrogen per 100 gm. of blood. About one-half of this nitrogen (12–16 mg.) is normally represented by urea, and the remainder represents chiefly amino acids and various soluble materials, as well as traces of uric acid, creatine, creatinine, and a barely perceptible trace of ammonia. Whenever the kidneys are not perfectly normal the total non-protein nitrogen of the blood goes up, and the proportion represented by urea is increased. Moreover, in middle-aged adults perfectly normal kidneys are the exception rather than the rule. Out of about 150 syphilitics examined the last two years in my laboratory three out of every four carried nitrogenous waste products in the blood greatly above the normal, and nearly the same conditions were found in the insane. Out of 45 nephritics of all kinds whose blood we have examined only 9, or 1 in 5, were normal with reference to the amounts of nitrogenous waste products in the blood. By means of blood analysis we can now determine with far greater certainty than is possible by any other test whether a given patient is or is not normally eliminating the nitrogenous waste products. For such a determination only 5 c.c. of blood are required.[2] The usefulness of this application of biochemistry to the study of clinical problems needs no emphasis.

One interesting problem in this field is the effect of different diets on the retention of waste nitrogen. By the selection of diets low in protein it should be possible to reduce the amount of work required of the kidneys to a level at which they may be able to keep the waste products in the blood within normal levels. We have recently tried this on a series of nephritic patients.

The following figures were obtained in four days by means of a diet consisting chiefly of carbohydrates:—

Blood Nitrogen.

On the regular hospital diet.	After the low nitrogen diet.
32 mg.	19 mg.
40 ,,	19 ,,
62 ,,	30 ,,
44 ,,	19 ,,
58 ,,	23 ,,
37 ,,	20 ,,
82 ,,	26 ,,
30 ,,	20 ,,
37 ,,	23 ,,
48 ,,	22 ,,

From the few figures cited (out of a great many) it is clear that it is possible to modify very much the level of non-protein nitrogen in the blood of nephritics, and to check up the effects by means of blood analyses. It is a curious fact that the blood in nephritis when high in urea is also high in other forms of non-protein nitrogen. In other words, it looks as if the accumulation of urea retarded the de-aminisation of the amino acids, for it seems unlikely, though this possibility is not yet excluded, that the increase is due in any large measure to other nitrogenous waste products such as creatinine. The ammonia is negligible. There is no demonstrable connexion between the blood pressure and the level of non-protein nitrogen in the blood.

One most interesting fact which we constantly meet with in blood analysis is that there is no correspondence between uric acid and the total non-protein nitrogen in the blood. In gout, or lead poisoning, or leukæmia the blood is uniformly rich in uric acid, yet the total non-protein nitrogen or urea nitrogen may be normal.[3] In pure nephritis or other cases of urea retention the uric acid is seldom much above the normal. This fact manifestly points to a selective activity on the part of the kidney with reference to the normal waste products.

We have recently investigated a number of gouty patients with reference to the effect of atophan (phenyl-chinolin-phenol) on the uric acid of the blood. The fact that the administration of atophan results in an increased uric acid elimination is well established, but a correct interpretation of how this is brought about can be obtained only on the basis of blood analyses, and it is only within the last year that it has become possible to determine the uric acid in blood with any degree of certainty. The following figures may be cited from our work:—

Uric Acid in Blood Before and After the Use of Atophan.

(The figures represent milligrammes of uric acid per 100 gm. of blood.)

Case.	Before.	After.	Case.	Before.	After.
1	5·4	3·4	4	5·7	2·2
2	5·0	1·1	5	3·1	2·2
3	3·1	1·2	6	4·0	1·2

The amount of uric acid in normal human blood varies between 1 and 2 mg. per 100 gm.

Atophan appears to stimulate the kidneys to increased activity, and it has no effect unless there is a rather high uric acid level in the blood. It does not "mobilise"

[2] For description of all the analytical methods referred to in this paper see Folin and Denis, Journal of Biological Chemistry, vols. xi.–xiii., 1912–13.

[3] For a uric-acid determination in blood 15–20 c.c. are required.

deposited urates except through the slight effect produced by the reduced uric acid content of the blood. Atophan stimulates the kidney not only with reference to the excretion of uric acid, but also with reference to the excretion of other nitrogenous waste products, so that the total non-protein nitrogen and the urea of the blood also sink in consequence.

There is in my mind not the slightest doubt but that by means of chemical investigations of blood, clinical problems of many kinds will be elucidated to a much greater extent than has been possible by means of urine analyses, though the two must usually go hand in hand.

Boston.

OPHTHALMIC PROGRESS IN EGYPT.[1]

BY A. F. MACCALLAN, M.D. CANTAB., F.R.C.S. ENG.,
DIRECTOR OF OPHTHALMIC HOSPITALS IN EGYPT.

IN 1903 a sum of £E.41,000 was placed at the disposal of Lord Cromer, then British Agent in Egypt, for the relief of sufferers from eye diseases by the liberality of Sir Ernest Cassel. It was decided to establish a hospital consisting of a camp of tents to travel round the country districts, remaining four or five months at each place. I came to Egypt to organise and to administer this and other means of ophthalmic relief subsequently inaugurated. These hospitals became a definite branch of the Egyptian Government service in 1906, in which year the first permanent hospital was built at Tanta.

Between the beginning of the year 1904 and the end of the year 1913 14 new hospitals will have been inaugurated in various parts of Egypt. For each of these establishments both the initial outlay and the cost of maintenance are assured. Both permanent and travelling hospitals have their place in the Egyptian system of ophthalmic relief, and each of these types has two or more varieties. The permanent hospitals which are now being built in the capital town of each province by the Government architects have accommodation for 14 in-patients. Some of the hospitals previously constructed, such as those of Assiut and Mansura, are much more commodious and were to a corresponding extent more costly. But the small type of hospital has been found sufficient for the needs of several of the 14 provincial capitals, since all the commoner operations, such as those for trichiasis and for trachoma, are performed on out-patients. The initial outlay required, which must be provided locally either by self-taxation, subscription, or gift, is about £E.5000. The expense of maintaining such a hospital, including salaries of two Egyptian surgeons, is defrayed by the Government at a cost of £E.1500. The number of patients who can be treated a day is from 200 to 300, including 20 new cases. Operations are performed daily from 9 A.M. to 11 A.M.

The travelling hospitals are an important feature of the system. Each hospital consists of a number of Indian tents, including one especially spacious for the performance of operations. Each camping-ground is occupied for four to six months. In this way most of the larger towns in Egypt have been visited. Only poor people are received as patients and all treatment is gratuitous. It is due to the popularity of these hospitals that the need for ophthalmic relief after countless generations of suffering and disability is becoming felt by the people of Egypt, a need which was not realised until the establishment in 1904 of the first hospital under my sole surgical charge.

The administration and clinical direction of these hospitals are vested in the director, with the assistance of two British and one native inspecting surgeons. The subordinate staff consists at the present time of 23 Egyptian surgeons, who, having completed the medical curriculum at the Government Medical School in Cairo, volunteer for ophthalmic training and service; the average man makes a good and careful operator for all lid affections; while a few of the senior men have attained to quite first-class operative ability in the performance of intraocular operations.

Owing to the powerful and sympathetic aid of Lord Kitchener, who has personally visited most of the hospitals, the annual amount available for ophthalmic purposes now amounts to £E.19,000, though even this sum is inadequate. In the province of Aswan it is proposed to provide a specially built dahabeah hospital at a cost of £E.2500 or £E.3000 as soon as this sum can be obtained. Neither the Government nor local effort can provide such an amount, and it is an opportunity for someone in England to extend his generosity and his sympathy with the people of this poor province. During a recent visit of a hospital to Aswan more than 16 per cent. of the patients examined were found to be blind in one or both eyes, the result of acute ophthalmia. The amount of blindness in Egypt is usually stated by non-professional observers to have largely decreased within the last 20 years; nevertheless, out of 43,668 patients examined during 1912, 6939 persons were found to be blind in one or both eyes—that is, nearly 16 per cent. It is probable that there has been a small diminution the result of the enforcement of compulsory vaccination, but enough has been said to show that ophthalmic conditions are still appalling, and no relaxation must be allowed in the efforts to improve them.

The different methods in which ophthalmic relief may be given have been thoroughly studied, and no time has been spared in the consideration of the various suggestions which have been made. Realising the impossibility of effecting an ophthalmic revolution in any finite period, it has been considered all important to put those means of relief which future generations will use and will profit by on a firm and lasting basis. The means which have been decided on are a permanent built hospital or its equivalent in the capital town of each province provided locally and maintained by the Government, and a travelling tent hospital with accommodation for a few in-patients provided and maintained by each provincial council. From each of these centres will develop various branches of work, including treatment of the pupils in schools and kuttabs, lectures on ophthalmic hygiene, distribution of pamphlets giving instructions for the prevention of infection, provision of first aid in eye diseases in the remoter villages, and talks in simple language to collections of women of the necessity of cleanliness for their children and of the way it should be effected. Money, skilled labour, and time will gradually work a vast improvement among a people who are intensely anxious to avail themselves of the small amount of ophthalmic relief which is at present obtainable.

Cairo.

[1] A communication read before the Ophthalmic Section at the Seventeenth International Congress of Medicine.

Reviews and Notices of Books.

JOURNALS AND MAGAZINES.

The Quarterly Journal of Medicine. Edited by WILLIAM OSLER, J. ROSE BRADFORD, A. E. GARROD, R. HUTCHISON, H. D. ROLLESTON, and W. HALE WHITE. Vol. VI., No. 24. July, 1913. Oxford: At the Clarendon Press; London, Edinburgh, New York, Toronto, and Melbourne: Henry Frowde. Subscription price 25*s.* per annum. Single numbers 8*s.* 6*d.* each.—The contents of this number are: On Auricular Fibrillation, by A. M. Gossage and J. A. Braxton Hicks. Four cases are recorded and carefully discussed. The authors conclude that the exact cause of auricular fibrillation is as yet unknown, but that it usually comes on in a heart where there has been disease of the valves or myocardial change. In one of their cases, however, the condition developed suddenly in a heart which had not previously shown any evidence of disease, and they suggest, therefore, that it is possible that auricular fibrillation may occur in previously healthy hearts, and if this is true, that the essential cause must be outside the heart.—Illustrations of Heart-Sound Records, by Thomas Lewis. A method of recording the heart sounds by means of a stethoscope, a microphone, and a string galvanometer is described, and some interesting photographic reproductions of the records obtained are given. These illustrate the normal heart sounds in man and the dog and the modifications produced by disease of the valves and other conditions. It is interesting to note that Dr. Lewis has found considerable difficulty in recording the systolic

apical murmur in a large percentage of cases of mitral regurgitation. Records are shown of aortic and pulmonary murmurs, and their time relations and vibration frequency are examined. The problem of reduplication of the cardiac sounds is shown to be complex and to require careful investigation by graphic methods.—The Incidence and Prognostic Value of the Pulsus Alternans in Myocardial and Arterial Disease, by J. Davenport Windle. Brief descriptions are given of the clinical histories of 33 patients with myocardial and arterial disease, and the author confirms the view expressed by Dr. James Mackenzie that the inception of pulsus alternans in aged people is of grave prognosis.—Pseudochylous Body Fluids, by John Marrack. The characters of two examples of milky-looking ascitic fluids are carefully examined. It is suggested that in such fluids some lipoid, not necessarily present in excess, is not in the usual state; possibly in clear fluids it is combined and in milky ones free.—Cysticercus Cellulosæ in the Central Nervous System, with an Account of Two Cases, by Rupert Waterhouse. Both cases are very carefully recorded and numerous blood counts are given, showing the eosinophilia. In one case, which subsequently died from meningitis following acute pneumonia, an eosinophilia of the cerebro-spinal fluid was observed. Plates are given showing the appearance of the brain in one case and of an excised cyst from the muscles in the other.—On Pneumothorax Treatment of Tuberculosis of the Lungs, by O. Amrein and F. Lichtenhahn. The technique of the procedure as carried out by the Murphy-Brauer method is described, and the results obtained in 11 cases observed by the authors are stated. The paper is illustrated by some good reproductions of skiagrams.—The Localisation of Function in the Kidney, by W. P. Herringham and J. W. Trevan. Some interesting observations upon six cases of nephritis, using the method suggested by Schlayer for investigating the activity of the tubular and vascular mechanisms of the kidney, are recorded.—The "Specific" Use of Salicylate in Acute Rheumatism: a Consideration of Practical Objections, by Reginald Miller. The purpose of the author has been to examine certain objections to the theory that salicylate diminishes the activity of the rheumatic infection, rather than establish its truth. He finds that these objections are in the main not valid.

Jahreskurse für Aerztliche Fortbildung. Munich: Lehmann. June, 1913. Price 18 marks per annum.—Professor Langstein reviews advances in diagnosis and treatment of the affections of children. After a brief article on the artificial feeding of healthy infants, he discusses pyelocystitis in childhood, which is not uncommon. Error in diagnosis may lead to severe illness or even death. In sucklings the most prominent symptom is usually a rise in the temperature, which may be high at night but normal in the morning, or may be continuous, and an apparently causeless fever in a baby should always arouse suspicion of this disease. The appetite is often lost and there may be great thirst. It may be possible to detect some swelling of one or both kidneys. The diagnosis is made by the examination of the urine, which is often turbid and shows leucocytes and bacteria under the microscope. The urine is usually acid. The commonest organism found is bacillus coli. Sometimes in unilateral cases the ureter from the diseased kidney may be blocked at intervals, so that the urine is alternately clear and turbid. In older children local symptoms, such as bladder pain and frequency, are more prominent. The causation is probably a blood infection from the alimentary canal, but it may ascend from the urethra. The prognosis is fairly good; many of the cases recover, but a few die. It is important to keep the genitals of children as clean as possible, and to avoid soiling of the urethra with fæces, so as to guard against this disease. The treatment is to supply abundance of fluid, both by the mouth and the bowel, to feed well (albuminous fluids giving the best results), and to administer alkalies and particularly urotropine, salol, or hippol. Vaccine therapy is mentioned but not advised. The next subject is chronic nephritis and albuminuria in children, usually occurring at about the school age. The forms described are chronic hæmorrhagic nephritis, a chronic nephritis resembling the above in symptoms and in the development of anasarca but lacking the hæmaturia, contracted kidney (exceedingly rare in children), pyelonephritis following on pyelitis, "pædonephritis," and intermittent albuminuria. Of these, "pædonephritis" is the most important. The symptoms are often vague and insignificant—loss of appetite, pallor, headache, occasional constipation. The quantity and specific gravity of the urine are normal, but it contains a good deal of albumin, a few blood cells, and hyaline and granulur casts. Some of the cases get well, but they are always in danger of development of a hypertrophied heart, high blood pressure, and uræmia.

Knowledge for August contains several articles which will appeal to the medical reader. In the Streamless Downs and their Dry Valleys, Mr. G. W. Bulman compares the dry chalk valleys in the south of England with the oueds of the African deserts, though not, of course, as to their origin, oueds being rivers buried by the drifting sand, their waters still passing along the old channels.—Mr. H. Stanley Redgrove has Some Notes on the History and Significance of the Theory of Spontaneous Generation, and Mr. E. Joblin discusses The Age of the Earth, while Mr. Ruskin Butterfield pleads for the establishment of a National Folk Museum at the Crystal Palace. A joint paper, well illustrated, by Mr. C. Ainsworth Mitchell and Mr. R. Morris Prideaux, on the Hairs of Animals, in which the authors state that they would be grateful for any authenticated specimens of hairs of out-of-the-way races of mankind that may be sent to them, will be read with considerable interest. One of the authors recently stated that, while there was a central canal or medulla in the hair of the higher apes, one was apparently not formed in human hair. Mr. Mitchell and Mr. Prideaux have been carrying out investigations, the result of which has caused them to modify this statement. It occurred to them that since the axillary hair in man is probably a vestige of his former ancestry, it was in such hair that a medulla would be most likely to be found. This was confirmed by a study of the hair from the arm-pit. The authors of the paper believe that the hair of human species of low type resembles that of some of the higher apes much more nearly than it does the hair of the average European.

DONATIONS AND BEQUESTS.—By the will of the late John Newton Mappin the testator left, subject to his wife's life interest, £1000 each to the London Hospital, Royal Free Hospital, North-Eastern Hospital for Children, Chelsea Hospital for Women, St. John's Hospital for Diseases of the Skin, Royal Hospital for Incurables, Epsom Cottage Hospital, Leatherhead Cottage Hospital, Cobham (Surrey) Cottage Hospital, Royal Sea Bathing Hospital, Margate, Children's Convalescent Home for Surrey (Bognor), Surgical Provident Appliances Society, Royal Hospital, Sheffield, and the Sheffield Infirmary.—The late Right Hon. William McEwan bequeathed £1000 to the Corstorphine Convalescent Home in connexion with Edinburgh Royal Infirmary.—Under the will of the late Mr. Benjamin Evans, of Llandovery, the following among other bequests have been made: £900 to the Swansea General Hospital, £225 each to the Swansea Blind Institution and the Swansea Deaf and Dumb Institution, and £100 to Earlswood Asylum.—Among the bequests made under the will of the late Miss Maria Mercer, of Clayton-le-Moors, Lancashire, are the following: £5000 to the Blackburn and East Lancashire Infirmary and £3000 to the Victoria Hospital at Accrington.

SEVENTEENTH INTERNATIONAL CONGRESS OF MEDICINE.

THE Congress came to a formal end on August 12th. Before the closing meeting an eloquent address on the progress of public health was delivered by the Right Honourable John Burns, President of the Local Government Board, which will be found published in full in this issue of THE LANCET.

Throughout the week numerous entertainments have been given by various bodies and various private hosts, a full account of which we make no attempt to give.

The council and staff of the London (Royal Free Hospital) School of Medicine for Women entertained at the medical school, Hunter-street, Brunswick-square, a large party of foreign and colonial delegates attending the International Medical Congress at luncheon on August 7th. The chairman of the council, Mr. F. D. Acland, M.P., was supported by Miss Aldrich-Blake, M.D., M.S., Sir Clifford Allbutt, Sir Rickman Godlee, Sir John Rose Bradford, Dr. Mary Scharlieb, Dr. May Thorne, Dr. Jane Walker, Dr. Ethel Vaughan-Sawyer, and other medical women. Among the guests were Professor Théodore Tuffier, who acknowledged the welcome addressed to the guests by the chairman and Dr. Mary Scharlieb, Dr. Rudolph Matas, Dr. F. von Müller, Professor Anthony, Dr. Maude Abbott, Dr. Sarah Palmer, Professor Bang, Dr. Másiná, and Sir Charles Lukis. The medical school laboratories were open to visitors, who were also shown over the Royal Free Hospital and the New Hospital for Women.

On Thursday, August 7th, Sir Alfred Pearce Gould, Dean of the Faculty of Medicine of the University of London, and Lady Pearce Gould gave a garden party at the College, Regent's Park, at which a very large number of the members of the Congress were present. It was unfortunate that this pleasant and generous reception should have fallen on the one day of the Congress when the weather could not be called genial, and undoubtedly a cold shower early in the afternoon proved a deterrent to the more faint-hearted. However, a very large company assembled, and were rewarded by a thoroughly pleasant afternoon.

The dinner given by the Society of Apothecaries of London on Thursday, August 7th, fully sustained the world-wide reputation of the City Companies for excellence in the science of hospitality and in the artistry of dining. The guests were received by the Master, Mr. W. Bramley Taylor, and the Wardens, Mr. Martindale Ward and Mr. Meredith Townsend. Those present numbered close on 80, the foreign guests including Dr. O. Josué, Professor P. Janet, Dr. R. W. Lovett, Professor Dr. A. Biedl, Professor Paul Ehrlich, Professor Pelizzari, Dr. A. Besredka, Dr. Emil Grahe, Professor Dr. Wenckebach, Professor Dr. Abderhalden, Professor Dr. L. Burkhardt, Professor W. Straub, Dr. W. J. Mayo, and Professor F. Wiedl. In accordance with old-established custom the loving cup was passed. After the usual loyal toasts the Master gave the toast of "The International Medical Congress" in felicitous terms. Sir Thomas Barlow, in responding, referred to the official recognition that had been given to science at this Congress. He deprecated the attaching of undue importance to such recognition, for the strength of science had always lain in its striving to lean only on itself. Nevertheless it was a gratifying fact that such recognition was now being so freely given, and he alluded to the Government dinner, which was universally admitted to have been a great success, as a distinct advance in that respect. He next paid a tribute to the efforts of the Society of Apothecaries as an examining body to keep itself progressive. Finally he stated that it was in the "domestic meetings," such as this, rather than in the big conversaziones, that our friends were drawn closer to us. The Senior Warden then proposed "Our Foreign Guests." He said that medical men, more than any other section of the community, realised the universal brotherhood of man. Foreigners among them were foreigners only in language and habitation; in all other things they were comrades. He drew attention to the bust of Gideon De Laune, discoloured, it was said, by the Great Fire of 1666, as an instance of the brotherhood that Englishmen entertained for foreigners. De Laune became Master of the Society of Apothecaries, and in his case even the difficulties attending his admission to the freedom of the City were overcome through the mediation of the King. Dr. Josué, in an eloquent sympathetic speech in French, Professor Dr. Burkhardt in a brief but incisive and straightforward speech in German, and Dr. Lovett in a humorous description of the difficulties under which American medicine had until quite recent years laboured, returned thanks on behalf of the guests. The toast of "The Society of Apothecaries" was proposed by Dr. Norman Moore, and acknowledged by the Master, and thus one of the most pleasant functions of the Congress was brought to an all too early end, necessitated by the manifold other engagements which claimed the presence of most of the guests.

On Thursday evening, August 7th, the President and Council of the Royal College of Surgeons of England entertained a large company at a soirée in the College. The guests were received by the President, Sir Rickman J. Godlee, and the Vice-Presidents, Mr. G. H. Makins and Sir Frederic Eve, in the Inner Hall. In the Conservator's Office an interesting collection of microscopical preparations from 1780 to 1812 was on view, and in Rooms VII. and VIII. of the Museum there was an exhibition of historical and anthropological specimens, while Hunterian relics and other objects of much interest were shown in the Council Room. During the evening the band of the Royal Artillery played a selection of music in Room I., and an excellent vocal concert was given in the Lecture Theatre. Refreshments were provided in the library. A very large number of ladies were present, and many nationalities were represented among the members of the Congress attending the soirée. The greatest interest was taken in the finely displayed and arranged treasures of the Hunterian Museum, and even the upper galleries were frequented by visitors throughout the evening.

The conversazione at the Royal Army Medical College, Grosvenor-road, S.W., on Thursday, August 7th, was a brilliant function, attended during the course of the evening by some 800 people. Surgeon-General Sir Launcelot Gubbins, Director-General, A.M.S., and Lady Gubbins received the guests, who, after partaking of refreshments, were permitted to thoroughly inspect the College, where many striking exhibits were on view, comprising service rations of various armies, with demonstrations of the damage by insects to which they are subject, demonstrations

of X ray and high-frequency electricity, methods of water purification and food analysis, clothing and equipment, demonstrations of various tropical diseases and microscopical specimens, field medical and surgical equipment, and so forth. A feature that attracted considerable attention was a cinematograph display of trypanosomes, amœbæ, bacteria, and spirochætæ, affording a very graphic conception of the struggle for existence in the infinitesimal world. The band of the Royal Army Medical Corps performed an excellent programme of music. The various uniforms of the military medical services of many countries contributed to the brilliancy of the scene.

On Friday evening, August 8th, the Corporation of London gave a magnificent conversazione at the Guildhall to welcome the members of the Congress. The entertainment, which was worthy of the City's reputation for hospitality, had been organised on a very large scale by a special reception committee of the Corporation under the chairmanship of Mr. H. H. Wells. The Lord Mayor, the Right Hon. Sir David Burnett, accompanied by the Sheriffs of the City of London, received the guests in the Guildhall. The spectacle in the Library, Art Gallery, Council Chamber, and Guildhall was a very brilliant one. Concerts and entertainments were given in the various rooms open for the reception, and there was dancing from 9 o'clock in the Library. In the Guildhall a selection of the Corporation plate from the Mansion House was displayed, and the museum and collection of ancient clocks and watches belonging to the Clockmakers' Company were also open for inspection. An additional delight for those to whom the City's treasures are unfamiliar was the exhibition of the ancient charters granted to the City of London by William I., Henry II., Richard I., and John, and the collection of manuscripts, medals, coins, and badges dating from the thirteenth century. Of the larger entertainments given in honour of the Congress the Guildhall conversazione must be accounted one of the most impressive and enjoyable.

A special feature of the entertainments of the Congress was the garden party at Windsor Castle at the invitation of the King on Saturday, August 9th. As the invitations were perforce limited to 2000, tickets were at first allotted on priority of application, but when it was found that the applicants would very greatly exceed those for whom it would be possible to make adequate provision, the distribution was proceeded with by ballot. Some half-dozen special trains, at intervals of a few minutes, were run between 2 and 3 P.M. from the Great Western Station at Paddington direct to Windsor for a return fare of 2*s*. On arrival at the Castle the King's guests were received at the grand entrance by the Lord Chamberlain on behalf of His Majesty, the Comptroller of the Household, the Deputy Master of the Household, the Surveyor of the King's Pictures (Mr. Lionel Cust), the Keeper of the King's Armoury (Mr. Guy Laking), and the Inspector of the Palace (Mr. G. E. Miles). When once the difficulties of the barrier at the entrance were surmounted and the crowd found themselves in the Great Quadrangle between the State apartments and His Majesty's private apartments, everything proceeded smoothly, though the carefully prescribed arrangements for taking the guests over the State apartments in parties of 100, each under the charge of a steward, had to be abandoned, the visitors following in a continuous stream. The apartments shown were the whole of the suite used by His Majesty when entertaining Sovereigns paying visits of State. Entering from the North Terrace the visitors passed up the grand staircase through the State Anteroom, the Picture Gallery, the Van Dyck Room, the Queen's Audience Chamber, the Queen's Presence Chamber, the Guard Room, St. George's Hall (decorated with the armorial shields of all the Knights of the Garter from its foundation), the Grand Reception Room decorated with Gobelin Tapestry depicting the story of Jason and Medea, to the Throne Room. Thence by the Ante-Throne Room, the Waterloo Chamber, the Grand vestibule and the grand staircase, out into the Italian gardens, where the band of the Coldstream Guards was playing. Passing thence on to the East Lawn, this magnificent pleasaunce attracted universal admiration. In large marquees an elaborate tea, with champagne, ices, and abundant delicacies, was provided, the tables being decorated with flowers from the Royal gardens. The spectacle was one of extraordinary vivacity, presenting the most democratic assemblage that has ever occupied that lawn. The visitors dispersed, many strolling over the demesne, while others congregated in groups greeting old friends and making new ones. Everyone seemed inclined to stay to the full limit of time. On passing through the castle to return to the station the visitors were shown the Albert Memorial Chapel and St. George's Chapel. Fortunately, the weather favoured the *fête*, and the entertainment provided was royal.

A delightfully intimate and admirably managed excursion was the river party on Sunday, August 10th, on the invitation of the President (Dr. Reginald Morton), officers, and members of the Section of Electro-therapeutics of the Royal Society of Medicine. The guests to the number of 160 embarked on the launch *Royalty* at Westminster Pier at 10.30 A.M., and proceeded up the river, calling at Richmond to take on a few who had failed to catch the boat at Westminster. Among the foreigners of note present may be mentioned Dr. Albers Schönberg (Hamburg), Professor Kienböck (Vienna), Professor Bergonié (Bordeaux), Professor Béclère (Paris), Professor Haret (Paris), Dr. Abbe (New York), Dr. Haenisch (Hamburg), Dr. Leroux (Paris), and Dr. Alban Kohler (Wiesbaden). Sir James Mackenzie-Davidson, President of the Section of Radiology of the Congress, was also present. The day was fine, and the genial care of Dr. Reginald Morton and Mr. Archibald Reid, the chief organising spirits, charmingly seconded by Mrs. Morton and Mrs. Reid, for the comfort of their guests was greatly appreciated by all. An excellent luncheon was served in three groups—at 12, 1, and 2 respectively. After passing Richmond the festal character of the river and the beautifully decorated houseboats attracted general attention. It had been intended to go up as far as Shepperton, but on reaching Sunbury it was considered desirable owing to the lateness of the hour to return. On the homeward journey afternoon tea was served. The party reached Westminster pier about 7.30 after a trip which, it was universally conceded, would long remain an outstanding memory of the Congress.

On Monday morning, August 11th, a deputation of the French members of Congress were met at the Royal College of Surgeons of England by the President, Sir Rickman Godlee, when they placed a wreath beneath the bust of Lister, newly executed by Sir Thomas Brock. It was a grave and charming ceremony, illustrating in a convincing manner the warm relations existing between the medical professions in France and England as well as the reality, so far as the educated classes are concerned, of the *entente cordiale*. The French medical men, whom we have been delighted to welcome among us, had expressed a desire to do homage to the memory of Lord Lister, and they accordingly subscribed for a beautiful memorial wreath of red roses

tied by a broad tricolour ribbon, suitably inscribed, which was laid before the bust of the great surgeon by a deputation of distinguished French physicians and surgeons. Sir Rickman Godlee, speaking in French, welcomed the deputation, which was accompanied by ladies, and remarking on the bust, said that it erred only in one particular, the too great length of the *favoris*, which required to be *raccourcis*. Lord Lister, as we remember him, wore short side-whiskers, as did most of the scientific men of his epoch, a prosaic appearance not easily treated by memorial art. The spokesman, on behalf of the French deputation, delivered one of those easy, fraternal, and delightful little speeches so familiar to frequenters of similar ceremonies at the Institut or elsewhere in Paris. He spoke of Lister as following always the Light of Truth, and referred with eloquence to that grand moment when, before an audience of the learned, Pasteur publicly embraced Lister. The picture recording this incident hangs in the hall of the Sorbonne, and the speaker was uncertain whether it rose to the height of the occasion. They afterwards looked at a collection of Lister's manuscripts, drawings, and instruments which had been prepared for their inspection.

At the session on Monday, August 11th, of the Section of Tropical Medicine and Hygiene, Professor Blanchard presented a large gold medallion to Sir Patrick Manson, as an acknowledgment from France of the value of his work in the prevention of malaria. The medallion bears on it a portrait of Sir Patrick Manson, and is the work of M. J. Richet.

Sir Thomas Barlow, as President of the Congress, gave a dinner on Monday night, August 11th, at the Savoy Hotel, at which some 200 foreign and British members of the Congress and distinguished guests were entertained. Among those present, in addition to the delegates from foreign Governments and the presidents of the different sections, and the officers of the Congress, may be mentioned the Archbishop of Canterbury, the Cardinal Archbishop of Westminster, the Dean of St. Paul's, the American Ambassador, the Lord Mayor of London, Lord Haldane, Mr. John Burns, Mr. McKenna, Mr. Sydney Buxton, Sir Archibald Geikie, Sir George Reid, Professor Ehrlich, Professor Harvey Cushing, Professor Chauffard, Lord Strathcona, Professor W. Bateson, Sir Rickman Godlee, Sir T. Clifford Allbutt, and Sir William Osler. The dinner was quite informal, and there was no toast list. Sir Thomas Barlow, after proposing the loyal toast, briefly welcomed his guests, while bidding them adieu at the close of the Congress. He assured all the foreign visitors to London that they had been most heartily welcome, and thought that no endeavour had been spared to make that apparent. Alluding to the distinguished persons present, he said that he had no intention of inviting any of them to make a speech, while he was gratified that they had come to testify by their presence to the far-reaching nature of the proceedings at the Congress and its great national importance. Dr. Lucas-Championnière, speaking in English, thanked Sir Thomas Barlow for his words, and British hosts generally for their hospitality, while Professor Ehrlich, in proposing Sir Thomas Barlow's health, testified to the admirable manner in which the Congress had been organised and to the perpetual feeling of friendliness which such gatherings must always arouse. During dinner the Westminster Singers delighted the audience with their admirable rendering of old British songs.

The following is the list of the 25 official delegates from foreign countries who attended the General Meetings of the Congress and spoke on behalf of their respective nations: United States of America, Dr. William Thayer; Austria, Professor Ritter von Haberler; Argentina, Dr. Eliseo Segura; Belgium, Professor Heger; Brazil, Professor Marcos Cavalcanti; China, Dr. Tuck; Cuba, Dr. Aristides Agramonte; Denmark, Dr. Madsen; France, M. Landouzy; Germany, His Excellency Professor v. Schjerning; Guatemala, Dr. Azurdia; Holland, Dr. Rijnberk; Hungary, Professor Dr. Emil de Grosz; Italy, Professor Bianchi; Japan, Dr. Takamina; Mexico, Dr. Jose Larumbé; Monaco, Dr. Caillaud; Nicaragua, Dr. Alejandro Cesar; Norway, Professor Dr. Uchermann; Portugal, Dr. Luiz de Freitas Viegas; Russia, General Dr. Rapschewsky; Servia, Dr. Subbotitch; Spain, Dr. Recasius; Switzerland, Professor Sahli; Sweden, Professor Essen Möller.

At the conversazione given by Lord and Lady Strathcona to the members of the Congress on August 11th the night was fine and the Botanical Gardens glowed with myriads of fairy lamps, outlining shrubberies and trees and flower beds. The walks were arched with Chinese lanterns, pendant one above another from long bamboo canes rising from the ground on either side and almost meeting over the centre, like gigantic incandescent Solomon's seals, and at the end of the walk the palm house gleamed iridescent as mother-of-pearl. The shadowy figures flitting about in the faint light of the lamps enhanced the weird beauty of the scene. The Royal Artillery Band and the Prince's Red Band added the charm of music; pipers from the Scots Guards played and danced; while the Folk Song Quartet rendered a selection of ballads with a sweetness that blended admirably with the eerie surroundings. Light refreshments were served in tents in the Gardens and in the Fellows' Dining-room. Lord and Lady Strathcona themselves received their guests, who approached, for lack of space, in a sinuous queue. Approximately 5000 persons were present. It was a charming *fête*.

Under the banner of the Æsculapius Lodge, No. 2410, and supported by the Rahere, the Cavendish, the Sancta Maria, the Middlesex Hospital, the London Hospital, the Chère Reine, the King's College Hospital, and the Lanesborough Lodges, a meeting of medical Freemasons in connexion with the International Congress of Medicine took place at Freemasons' Hall on Monday afternoon, when nearly 300 members of the craft were present, including a large number of foreign and colonial brethren. A lodge was opened by the W. M. (Dr. A. P. Beddard) and the officers of the Æsculapius Lodge, and later the Pro-Grand Master of England, Lord Ampthill, occupied the chair, Mr. Edmund Owen, P.G.D., and Mr. Ernest Clarke, P.G.D., acting as S.W. and J.W. respectively. Lord Ampthill welcomed the brethren present in the name of the Grand Master, the Duke of Connaught, and claimed that the three great principles on which the order was founded were carried out to the fullest extent by members of the medical profession. Addresses were afterwards given in French and German, and several representatives of foreign and colonial lodges also spoke. Tea and coffee were served from 3.30 to 4.30, and the arrangements for the meeting were admirably organised by Dr. R. J. Probyn-Williams, P.G.D.

THE INTERNATIONAL ASSOCIATION OF MEDICAL MUSEUMS.

Highly successful meetings of this association took place at the Royal College of Surgeons and the Imperial College of Science on August 5th, 6th, and 7th last in conjunction with the Seventeenth International Congress of Medicine. There was a large and representative international attendance.

The meeting was opened by Professor ARTHUR KEITH, honorary president, who, as chairman of the Museum Committee of the Congress and curator of the museum of the Royal College of Surgeons, welcomed the members to London, and introduced the President, Professor A. S. WARTHIN, of Ann Arbor, Mich., who gave an address upon the Ideals and Functions of the International Association of Medical Museums. The association had entered upon its seventh year of existence, and this was its second triennial international meeting. During this time it had grown from small beginnings to a membership of over 200, including among them the leading pathologists and anatomists throughout the world. It was an Association of Medical Museums, its scope extending beyond pathology into all the fields of medicine, particularly in the direction of preventive medicine and hygiene. At the present time there was a strong demand for a museum of preventive medicine on a popular basis, such as is illustrated by the travelling museums of the campaign against tuberculosis. The organisation of such popular museums should be one of the special functions of this Asssociation, as also the discussion of methods of demonstrative teaching of all kinds. The need for a society in which medical teaching in general, both demonstrative and otherwise, could be considered, was pointed out, and the plea made that this society might widen its scope to include this field. The most important side of this Association was its international character and at this meeting the organisation of the international body and of its local or sectional societies was to be thoroughly worked out.

Sir WILLIAM OSLER opened a discussion on the improved organisation of this Association on the international basis. He prefaced his remarks by a tribute to the memory of the late Sir Jonathan Hutchinson, whose recent death had removed from among us one who had been for many years a pioneer worker in the field of medical museums, a collector in the most scientific sense, whose remarkable breadth of interest and clearness of intellect made him a demonstrative teacher of the highest type. Especially in connexion with the formation of the popular museum, which Professor Warthin had rightly described as one of the special functions of this Association, the life work of this great man was of interest, and all those who could visit his wonderful popular museum at Haslemere would learn there the results which careful classification of well-chosen material along any line can bring. Returning to the subject, Sir William Osler believed in the usefulness of the Museums Association as an international association of exchange of material and of discussion of methods, both of technique and of demonstrative teaching. There were difficulties, of course, such as the geographical one, in its international development, but he thought the plan suggested practicable of a central bureau which would control the different branches in various countries and hold meetings in the country where the International Medical Congress was held. Each country should be allowed a certain amount of autonomy in managing its own society, and under these conditions a highly useful work could be carried on.

Professor LUDWIG ASCHOFF (Freiburg) spoke warmly in favour of the aims and objects of this Association. He saw no difficulty in the international organisation, except as regards the international fee, which should be reduced somewhat as soon as the membership increased sufficiently to justify this. He recommended that a propaganda for the extension of membership be instituted by the local societies in the various countries, and to this end that copies of the President's address be translated and circulated.

Professor SPALTEHOLZ (Leipzig), Professor W. G. MACCALLUM (New York), Professor J. G. ADAMI, Professor F. J. SHEPHERD (Montreal), and others participated in the discussion, and the following recommendations for the international organisation were adopted:

1. There shall be a central international body with international officers, and local or sectional societies with local officers, one society in each country represented.

2. The meetings of the international body shall be held at the same place and time as the meetings of the International Congress of Medicine. The meetings of the sectional societies shall be held annually or more frequently, according to the decision of the individual society.

3. The officers of the local societies may be elected annually or triennially, and shall consist of a president and secretary, and as many other officers as the local society shall decide. The officers of the International Association shall be as provided under the present constitution. They shall be elected triennially at the international meeting for the ensuing triennium and for the next international meeting, except the secretary, whose position shall be permanent. The president shall, whenever possible, be elected from that country where the next international meeting will be held.

4. A local fee may be arranged at the discretion and option of the local society, but the international fee shall remain $2 (two dollars). It shall continue to be paid to the international secretary, and shall be devoted to the cost of the bulletin, the payment of international postage, and other international outlay.

5. The meetings of both the International Association and also of the sectional societies shall be reported in the bulletin, and all communications presented at all such meetings shall be available for publication in the bulletin. This will not preclude their publication elsewhere as well, nor is the editorial committee pledged to publish all papers presented at either the international or sectional meetings.

Mr. H. W. ARMIT, secretary of the Museum Committee of the Congress, dwelt upon the relation which such an association as this might have to the meetings of the International Congress of Medicine. After a prolonged experience in the organisation of congress museums, the conclusion had been forced upon him that efficiency was sacrificed, much time lost, and valuable experience wasted by the placing of arrangements at each Congress in the hands of a new set of comparatively untrained persons. In the International Association of Medical Museums we have a society of museum experts which seems peculiarly fitted to undertake the organisation of the Congress Museum as a whole. It was therefore moved by Mr. ARMIT, seconded by Professor KEITH, and resolved: "That in future the organisation of the museum of the International Congress of Medicine be entrusted to the International Association of Medical Museums."

The secretary was instructed to write to the secretary of the standing committee of the Congress communicating the resolution to him and requesting that the executive of the association be put in communication with the national committee or government of the country where the next meeting of the Congress will be held.

The following officers of the international body were elected:—President: Professor Ludwig Aschoff (Freiburg). First Vice-President: Professor Arthur Keith (London). Second Vice-President: Professor Pierre Marie (Paris). Third Vice-President: Professor R. M. Pearce (Philadelphia). Secretary-Treasurer: Dr. Maude E. Abbott (Montreal, Canada). Councillors: Sir William Osler, Bart. (England), Professor J. G. Adami (Canada), Professor A. S. Warthin (United States), Professor Bernard Fischer (Germany). Professor Paul Courmont (France), Professor J. Fibiger (Denmark), Professor Harbitz (Norway), Professor Askanazy (Switzerland), Dr. de Josselin de Jong (Holland), Dr. René Sand (Belgium).

The Dutch members present declared the following local officers elected for the Holland Section:—President: Dr. Georgine Luden Van Heumen. Secretary: Dr. Ariens Kappers. First Vice-President: Dr. de Josselin de Jong.

A hearty vote of thanks was tendered to Professor Keith and Dr. Armit for their courteous and efficient coöperation in the arrangements for the London meeting.

A very interesting programme consisting of papers and demonstrations along the lines of museum and microscopic technique was successfully carried out.

Professor SPALTEHOLZ demonstrated an extremely beautiful series of preparations of various organs and tissues rendered transparent by a method original with him whereby the finest details of the internal structure are revealed.

Dr. R. A. LAMBERT (New York) gave a lantern slide demonstration illustrating the staining of living tissues cultivated *in vitro*.

Dr. C. F. SILVESTER (Princeton, New Jersey) demonstrated methods of mounting very delicate material by attaching the specimen by means of glass pins to sheets of wax.

A new method of maceration and teasing was given by Professor G. C. HUBER (Michigan, U.S.A.), by means of which he has been able to isolate the entire renal and seminiferous tubules. New forms of cement for sealing museum jars were announced by Mr. WM. MUIR and E. L. JUDAH (Montreal, Canada) and Dr. COBURN (Pittsburg, U.S.A.).

A most interesting symposium on the staining of nerve fibres and cells occupied the greater part of Thursday's session, new and valuable methods being announced by Dr. GEORGINE LUDEN VAN HEUMEN (Munich), Dr. C. A. U. KAPPERS (Amsterdam), and Dr. RENÉ SAND (Brussels).

Professor ADOLPH MEYER (Johns Hopkins University) showed three beautiful glass reconstruction models of the human brain.

Professor WAHLBY (Cairo, Egypt) demonstrated very fully his methods of corrosion by which the finest ramifications of the body cavities and the vascular system can be demonstrated.

Other papers presented were relative to exhibits in the section of Museum Technique of the Congress Museum by Dr. E. C. ROSENOW (Chicago), representing the pathology and etiology of endocarditis, Professor DELÉPINE (Manchester), illustrating various types of infectious diseases, and Dr. A. A. BRUÈRE (Montreal), showing mounted colonies of fungi in gelatine plate cultures sealed with paraffin.

THE SECTIONS.

SECTIONS I. AND III.—JOINT SESSION OF THE SECTION OF ANATOMY AND EMBRYOLOGY WITH THE SECTION OF GENERAL PATHOLOGY AND PATHOLOGICAL ANATOMY.

THURSDAY, AUGUST 7TH.

President, Professor ARTHUR THOMSON.

Discussion on the Excitatory and Connecting Muscular System of the Heart.

The PRESIDENT of Section I. (Anatomy and Embryology), Professor ARTHUR THOMSON (Oxford), introduced the reporters to the meeting, and in his opening address welcomed the members of the two sections which were to take part in the discussion.

Dr. IVY MACKENZIE (Glasgow) gave an abstract of his report which dealt with the Comparative Anatomy of the Excitatory and Connecting Muscular System of the Heart. He pointed out how variable was the development of this system not only in different classes but even in different species; and he traced the evolution of the undifferentiated heart tissue from the simple condition in the fish to the scattered and complicated condition in the mammal. This evolution took place hand in hand, and was indeed caused by the growing complexity of the heart chambers in the higher orders. Dr. Mackenzie pointed out, however, that no matter how this tissue was disposed in the heart wall and to whatever degree its scattering and complexity was carried, it always retained its own distinctive features, among which was its abundant nerve-supply, which differentiated it from heart muscle fibres to which nerve terminations were difficult or impossible to trace.

Dr. O. JOSUÉ (Paris) gave an abstract of his report on Les Localisations Cardiaques. The speaker directed particular attention to the clinical aspect of the question, and demonstrated that clinical experience dictated the belief that the heart mass was composed of different kinds of musculature with different physiological rôles to discharge. Pathological lesions made this clear. Lesions of the myocardium, even when very small, were capable of producing profound clinical manifestations, whilst on the other hand extensive lesions might produce very little disturbance. The localisation of cardiac myocardial lesions determined the clinical symptoms.

Dr. THOMAS LEWIS (London) demonstrated his report on the Pacemaker of the Mammalian Heart. This demonstration was for the most part concerned with an explanation of the methods of research. In the simple non-mammalian heart the anatomical conditions rendered research more easy, for with the electrocardiogram the actual progress of the process of contraction may be studied. Experiments were detailed which showed that by an artificial excitation a cardiographic tracing could be produced similar to that given by a normal beat. This occurred only when one particular point was chosen for excitation, and this point corresponded anatomically with the site of the sinu-auricular node. Dr. Lewis then detailed experiments dealing with damage or excision of the node or of the *a.-v.* bundle, showing that the difference of method accounted for the different results obtained by various investigators.

Professor KÜLBS (Berlin) then read his report on the Anatomy of the Bundles of the Heart. This report dealt exhaustively with the condition found in the hearts of different zoological types. In the fish with one auricle and one ventricle a simple "funnel" transmits the musculature of the auricle to the ventricle. In amphibia and reptiles with two auricles and one ventricle the "funnel" becomes divided into two parts. In birds with two auricles and two ventricles two separate "funnels" exist, joined only at the interventricular septum. In mammals the complete system consists of (1) the Aschoff-Tawara node, (2) the bundle of His, and (3) the extension from this which runs beneath the endocardium of both ventricles. In fish, amphibia, and reptiles the differentiation of this system from heart muscle is by no means so complete as it is in birds and mammals.

Dr. A. F. STANLEY KENT (Bristol), in giving the first independent paper, laid stress on the need to study more attentively the possibility of other connexions between auricle and ventricle than that furnished by the *a.-v.* bundle itself. Clinical cases and actual anatomical investigation showed that other connexions existed, and that neuromuscular elements were present which could function at times independently of the main bundle.

Dr. LOUIS FAUGÈRES BISHOP (New York) spoke in favour of recognising functional disorders of the structures of the heart altogether apart from anatomic changes. Toxicardia, possibly due to particular protein derivatives to which the heart has become sensitive, accounted for nine-tenths of the cases met with clinically. Treatment demonstrated the correctness of these views. No doubt these toxicardia cases, which had a purely functional initial stage, proceeded to anatomic changes; but it was essential for the clinician to recognise that there *was* a primary functional stage.

Professor ARTHUR KEITH (London) entered a plea for further study of the function of the bundle, for he considered it by no means certain that conductivity alone was the rôle of this structure. He advised research being directed towards other organs, such as the stomach, where there was evidence of similar connexions and mechanisms in the musculature.

Dr. ALEXANDER MORISON (London) made reference to the disposition of the nodal tissue in a malformed heart of which he had made an exhaustive study.

Dr. C. E. LEA (Manchester) and later, Professor K. F. WENCKEBACH (Strassburg) produced clinical evidence that the bundle was no mere connecting bond, that other functions were in all probability lodged in it, and that the condition of the ventricle to respond to a transmitted stimulation had to be reckoned with.

Professor L. MUSKENS (Amsterdam) and Dr. A. D. HIRSCHFELDER (Baltimore) dwelt especially upon experiments carried out on the heart of frogs. Professor P. L. ASCHOFF (Freiburg) and Professor A. D. WALLER (London) having spoken, the reporters replied.

SECTION III.—GENERAL PATHOLOGY AND PATHOLOGICAL ANATOMY.

WEDNESDAY, AUGUST 6TH.

President, Professor S. G. SHATTOCK (London).

The PRESIDENT opened the proceedings by welcoming the members of the section, and then in a short introductory address said that one thing all must have long since discovered from personal experience was the large proportion of work which was unattended with any positive result. The tentative questions which when put to the test of experiment received negative answers would, if added up, far outnumber the contrary. How much brilliant and promising work had they not all designed, the results of which had never been recorded because they had fallen into the barren category. In a certain sense they could not be dissatisfied with such negations, since something that was deemed possible had been disproved, and the way cleared, in the same degree, to the access of positive truth. Human biology was unique in that every form of energy in the universe was concerned and took part in the final phenomenon of life. The explanation of what one might call this "negative science" (from the "discoveries" in which not even the greatest were exempt) was, of course, the incalculable complexity of what was investigated, as contrasted with the limitations of the researching instrument—the investigator. One ever-present temptation arising from such a state of things, and one to which they all in some degree

succumbed, was to substitute, of course without intention, conjecture and verbal formulæ for disappointed knowledge. Let them see to it that in the meetings of that section they overcame as far as possible their common failing.

The PRESIDENT then read a paper on

Morbid Thickening of the Calvaria and the Reconstruction of Bone once Diseased: a Pathological Basis for the Study of the Thickening Observed in Certain Pleiocene Skulls.

He referred particularly to the recently discovered Piltdown skull which was uniformly thickened, though the osseous tissue was not diseased; yet it opened up the question whether the bone had been reconstructed after having been thickened by some previous morbid state. In the Royal College of Surgeons of England was a fossilised specimen showing osteitis deformans, which had been obtained by John Hunter. He excluded syphilis in European specimens of the pleiocene period, but agreed with Professor Elliot Smith that there was evidence of syphilitic disease in the bones from ancient Egypt. He illustrated the reconstruction of bone in the case of inherited syphilis and rachitis. His description included acromegaly, leontiasis ossea, and hypertrophic pulmonary osteoarthropathy. In osteitis deformans no reconstruction ever took place. In the long bones reconstruction was but rarely seen in syphilitic enlargement and sclerosis, but at times a cancellous tissue might replace the sclerosis. The Piltdown skull, he held, was not syphilitic, nor was it a case of osteitis deformans, and the absence of frontal thickening showed that it was not from an insane individual.

Professor J. G. ADAMI (Montreal) read a paper on Hyperblastosis and its Relationship to Blastomatous Growth (true tumours)

Dr. E. F. BASHFORD (London) communicated a paper on

Cell Variability during the Propagation of Tumours,

and said that the renewed interest in the well-known association between certain forms of cancer and chronic irritants was due to the wide recognition of the fact, demonstrated by the Imperial Cancer Research Fund, that various native races performed unintentional experiments on themselves. By irritating portions of the body they changed the liability of its several parts as known in Europeans. The irritants had nothing in common. The manner in which animals were treated in different parts of the world produced similar divergences in the parts of the animal body attacked. The action of the irritants was obviously indirect, because a large proportion escaped the disease in the part irritated, and it was not acute but chronic irritation which led to the development of cancer both in man and animals. The chronic irritation was equivalent to maintaining the tissues in a prolonged state of proliferation, and by transplanting the ready-made cancer cell it was possible to prolong this to any period desired, the idea being to observe whether it was constant or variable in its behaviour, and to infer from this what its behaviour in the animal attacked had been before it was discovered as a cancerous cell. Highly technical experiments were described, which demonstrated that the tumour cells either varied or remained constant in a large number of their properties. These variations were shown to be identical with those observed in tumours in their hosts of origin. Of particular significance was the fact that powers of progressive growth and dissemination in the body were acquired by losing the power—common both to normal tissue and some forms of tumour—of producing hindrances to their own growth.

Dr. J. A. MURRAY (London), in a paper on

The Heredity of Cancer in Mice,

described the results of the heredity experiments recently summarised in the report of the annual meeting of the Imperial Cancer Research Fund. The general conclusion that cancer was nearly twice as frequent in mice of which the mothers or grandmothers had died from cancer as in mice in which these ancestors were free of the disease was further strengthened by an improved method of calculation of death-rates for these animals giving a similar result.

Mr. E. W. HEY GROVES (Bristol) read a paper on

The Repair of Fractures and the Influence of Various Operative Procedures.

His conclusions were as follows:—1. Screws which merely bit into the side of bone were unsuitable for treatment, as they rapidly loosened by a process of bone absorption if subjected to much tension. 2. Absolute fixation of fractured ends was conducive to good repair. 3. The only mechanical contrivances for uniting bones were pins, nuts, &c., which perforated the entire bone. 4. Great mobility was likely to produce a false joint, especially in a single bone like the femur. 5. Marked mobility caused excess of callus. 6. Metallic magnesium was absorbed and caused great callus excess. 7. Indirect methods of fixation gave the most ideal results, and this was the only method possible when dealing with compound and comminuted cases. 8. The periosteum had no power of forming callus or new bone. 9. The periosteum was of value as the chief blood-supply to the callus and in limiting its extent. 10. Active callus and bone formation always occurred from the broken surface of the bone, and every small fragment acted as a centre of new bone growth.

THURSDAY, AUGUST 7TH.

Professor L. ASCHOFF (Freiburg) read a paper on

The Thymus Gland.

His work pointed to the gland having some relation to the growth of bones. Its removal in young animals (rats and guinea-pigs) had led to changes indistinguishable from those in human rickets, the animals showing improper growth. There occurred also enlargement of the thyroid gland. He had demonstrated also the power of the thymus to regenerate. After partial thymectomy in rabbits there occurred a rapid regeneration, so that in a few days numerous cells and nuclei appeared; the so-called embryonic lymph cells became transformed into the true thymus cells, so these must not be regarded as true lymph cells, for the thymus was an epithelial organ. Its removal in human beings led to a "cachexia thymepriva."

Professor W. G. MACCALLUM (Columbia University, U.S.A.), reported some

Experimental Studies on Tetany

which he had produced after extirpation of the parathyroid gland. He concluded that tetany was the result of some abnormal change in the circulating blood which affected the extremities. By anastomosing vessels of affected and normal animals he had been able to transpose at will the blood of tetany animals or that of normal animals so as to produce the condition of tetany or to cause a subsidence of the symptoms. Also he had produced tetany by using defibrinated blood of tetany animals and injecting into normal animals. As to the nature of this blood change he could only hypothesise, and he considered there was evidence that it was associated with an excess of calcium bodies. Certainly there was no definite evidence of a circulating poison of the nature of an alkaloid.

Dr. C. BOLTON (London) gave an account of his long-continued work on

The Pathology of Gastric Ulcer,

illustrated with numerous lantern slides. He had most recently devoted attention to acute ulcers, which he considered more frequent than was usually thought. Most of these healed spontaneously, though a few, as he illustrated, extend. Experimenting with his gastrotoxins, he concluded that there was no necessity to have an initial lesion. Of great importance was the presence of an excess of acid (hyperacidity)—even acetic acid—in association with bacterial toxæmia. His diet experiments showed that the ulcer spread much more rapidly and healed much more slowly on a meat diet than on a milk diet.

Dr. CHARLES SINGER (Heidelberg) summarised his work on the experimental production of

Gastric Ulcer in Rats,

which was published in THE LANCET of August 2nd, p. 279. His view as to the etiology was that ulcer could result from some unknown micro-organism which normally inhabited the intestinal canal, but only existed in the stomach under abnormal conditions.

Professor SHATTOCK reported some work carried out in collaboration with Dr. L. S. DUDGEON (London) on the

Vitality of Chemically Dried Protoplasm.

They had shown that some lowly forms of life—e.g., B. pyocyaneus—could be dried *in vacuo*, and if kept away from sunlight could remain potentially viable, and even virulent, indefinitely. At any rate, during the two years that the experiment had been in progress no change had

occurred in the organisms. On exposure to air and sunlight, however, they rapidly died. Professor Shattock put forth the idea that every change of function implied some alteration of protoplasm, and there must be consequently as many varieties of protoplasm as there were functions. He pointed out, half in jest perhaps, the relation of these experiments to the question of immortality.

Dr. GNEZDA demonstrated slides dealing with the Histological Appearances of Cancer which had been treated with Arphroalin.

SUBSECTION IIIA.—CHEMICAL PATHOLOGY.

THURSDAY, AUGUST 7TH.

President, Dr. F. GOWLAND HOPKINS (Cambridge).

The PRESIDENT, in welcoming the members of the section, stated that this meeting inaugurated the meetings of the subsection not only in this particular Congress, but in all International Medical Congresses, as this year was the first in which the subsection had been separated from the Section of General Pathology. Its formation was a recognition of the ever-increasing importance of chemical pathology, not only in research, but also in its clinical applications.

Dr. H. SCHAUMANN (Hamburg) opened a discussion on

Pathological Conditions due to Defects in Diet.

He pointed out that of late years ideas had completely changed as to what was necessary for a sufficient diet. Not only were the main nutritive substances—albumins, carbohydrates, fats, salts, and water—essential, but also certain other substances were necessary which were present in foodstuffs only in the minutest quantity. Such substances were probably very numerous and were at present mostly unknown, and one compound, vitamine, had recently been isolated in crystalline form. They were present in relatively large amounts in certain animal and vegetable matter, such as yeast, the pericarp of rice, barley, wheat, the brain, heart, and eggs of mammals and birds. They probably seldom exist in the free state, but were constituents of more complicated molecules, such as nucleins and phosphatids. Their absence gave rise to specific disorders in each case, such as beri-beri, scurvy, Möller-Barlow's disease, and pellagra. They were labile, being destroyed by long storage, long heating and cooking, alkalies, and microorganisms, and were removed by such processes as husking and polishing rice, extraction by salt, lye, &c. As the methods of isolation were at present very imperfect they had not yet been obtained in a pure form; it was therefore impossible as yet to say whether their efficiency is or is not due in part to the phosphorised group of the whole molecule or not. Another explanation might be that the metabolism of phosphorus was especially assisted by them.

The PRESIDENT said that Dr. Schaumann had so thoroughly reviewed the present state of knowledge of the subject that he would confine himself to the more physiological aspect of the problem, and discuss the question, whether the normal growth of a young animal required of necessity factors in its dietary of which till recently no account had been taken. If the absence of these substances arrested growth, it was reasonable to suppose that they might also cause natural diseases of nutrition. He had himself worked almost exclusively on rats, always using large numbers of animals and ample controls. An artificial diet of pure proteins, fats, carbohydrates, and salts caused young rats to cease to grow within about 15 days, though a minute addition of certain tissue extracts and fractions of such extracts secured normal growth. Of the chemical nature of these substances little could at present be said, neither the vitamine of Dr. Funk nor the oryzanin of Suzuki maintaining growth for any appreciable time. His greatest success had up to the present been with phospho-tungstic precipitations. The substances did not seem to be basic in character or of the nature of lipoids. They were slightly soluble in alcohol, insoluble in ether, and easily disappeared during chemical manipulations. The additions that had been found sufficient had been free from the amino-acids, purin and pyramidin basis, and did not contain choline. With regard to salts, an artificial mixture was certainly not as efficient as the ash of mixed foodstuffs. This might be due to faint traces of such substances as fluorine or manganese in the food. An artificial salt mixture almost invariably caused in his experiments a peculiar condition of conjunctivitis allied to keratomalacia. Salts alone, however, were not the only factor, as in other experiments the additions given were entirely salt-free.

Dr. C. FUNK (London) stated that crude vitamine fraction could now be isolated without difficulty, and probably consisted of three separate fractions.

Professor IVAR BANG said that these researches were only in their infancy, and needed much more work.

Professor BENJAMIN MOORE (Liverpool) suggested that the effect of feeding the children of the poorest class on skim milk and bread adulterated by bleaching and other processes might partly be explained on the lines of the present discussion.

Professor BARGER, Dr. SIGMUND FRANKEL, and Dr. ALEXANDER HAIG also spoke.

After Dr. SCHAUMANN had replied, the general resolution on vivisection, which is being circulated in the Congress, was carried unanimously.

Afternoon Session.

Dr. E. LAQUEUR (Gröningen) had sent a paper which was read by Dr. FUNK, drawing attention to the close parallelism and possible identity of the processes of post-mortem autolysis and intravital protein metabolism.

In the discussion which followed it was agreed that the identity of the two processes was generally accepted by the most recent workers.

A paper by Dr. PINCUSSOHN (Berlin) was concerned with the reactions of ferments of the blood. It was pointed out that the blood of any given animal contained ferments which hydrolysed the peptone derivatives of its protein, but not those of foreign proteins. The latter, however, gave rise to the formation of a ferment which destroyed the protein itself.

Dr. A. GELARIE (Liverpool) read a paper claiming that a precursor of complement, "pro-complement," was probably the cause of anaphylaxis.

An animated discussion, opened by Dr. G. GRAHAM (London) and Dr. J. W. TREVAN (London), on the Analysis of Test Meals brought the proceedings to a close.

SECTION VI.—MEDICINE.

THURSDAY, AUGUST 7TH.

President, Sir WILLIAM OSLER, Bart. (Oxford).

THE proceedings were opened by the PRESIDENT with a few introductory observations. Over 200 members of the section were present, and the first paper they heard was Professor G. BANTI'S (Florence) exhaustive account of the

Clinical Aspects of Hæmolysis,

more particularly as they affected the spleen. In many patients with splenomegaly, as he pointed out, they found anæmia, and a great deal of work had been done that tended to prove that the anæmia in such patients was due to excessive hæmolysis that took place in the pathologically enlarged spleen. He made reference to the association of splenomegaly with cirrhosis, a combination which was familiar, by name if not *de visu*, to most medical men as Banti's disease. He summarised the work that had been done so extensively on the continent of Europe with hæmolytic serums, and noted that the spleens of animals treated with such serums showed changes very similar to those met with in the splenomegaly with anæmia of human beings.

Among the other speakers who illuminated this somewhat academic, or at any rate highly technical, subject was Professor CHAUFFARD (Paris), who ascribed an important rôle to the spleen in all the human diseases that were characterised by the occurrence of hæmolysis. He did good service by bringing out the fact that the enlargement of the spleen habitual in these cases might be either the cause of the hæmolysis or its effect. If it was the cause of the hæmolysis, clearly the condition would be improved and the anæmia cured by the operation of removing the spleen. If, on the other hand, it were an effect of the hæmolysis, splenectomy would only accelerate the patient's passage to the grave. How could one distinguish between the two

cases, he asked, and how could one know when splenectomy was advisable? These questions he could not answer with any confidence himself, and he called for further investigation and information on the results of removal of the spleen; animal experiments had given contradictory results in the hands of different observers.

An interesting paper on

Duodenal and Pyloric Ulcers

was read by Professor C. A. EWALD (Berlin). He pronounced himself horrified by the statistics of British and American surgeons, who claimed to have proved that duodenal ulcer was a commoner, perhaps a far commoner, complaint than ulcer of the stomach. Reference to the post-mortem room statistics afforded no support to such surgical statements; in his own clinique he had had and treated 532 cases of gastric ulcer and 82 of duodenal ulcer during the three years 1910-11-12, and he quoted continental (European) statistics to prove that as a matter of fact gastric ulcer was quite six times as common as ulcer of the duodenum. Yet he was at pains to acquit the surgeons of intentional error in their statistics, and explained that their mistake arose, on the one hand, from the fact that they only met with the severe and the chronic cases of such ulceration and, on the other, from their habit of including among duodenal ulcers those ulcers that extended from the pylorus. Professor Ewald doubted whether regional or occupational factors could afford an explanation of the surgical statistics and the inferences surgeons drew from them. He further felt himself bound to dissent very strongly from the dictum of Sir Berkeley Moynihan, who said that a careful previous history was all that was needed to make the diagnosis of duodenal ulcer, and that it was not necessary to examine the patient before coming to a positive conclusion. Professor Ewald pointed out how cases of cholecystitis, appendicitis, tabes with gastric crises, or even severe neurasthenia, might find themselves exposed to operations for the cure of non-existent duodenal ulcers should such diagnostic criteria as Moynihan's be accepted as adequate. He himself laid particular stress on three or four points in diagnosing duodenal ulcer. 1. The long duration of the case, and the recurrence of pain two or more hours after food had been taken. 2. The presence of manifest or occult blood in the stools; repeated examinations might be called for before this blood could be demonstrated. 3. Hyperchlorhydria, which was almost constantly found, and might be seen even when the patient was fasting. 4. Skiagraphic examination of the stomach after a bismuth meal; the duodenum was then seen to fill up with unusual rapidity, the stomach was often not empty even after six hours, the gastric peristalsis was abnormally forcible, and the stomach itself was frequently displaced downwards and to the right.

Dr. MAX EINHORN and Dr. N. E. BRILL (New York) both disavowed the surgical statistics to which Professor Ewald had taken such exception, so far as America was concerned; while Professor R. SAUNDBY (Birmingham), though eager to advocate operative treatment in a large number of the cases of duodenal ulcer, expressed himself as not prepared to go as far in this direction as certain British surgeons of eminence.

Professor N. E. BRILL (New York) in the afternoon session read an interesting paper on

An Acute Infectious Disease Similar to, and perhaps a Modified Form of, Typhus Fever.

At the outset he was careful to explain to his audience that typhus fever was not the same as typhoid fever, better called enteric fever. His observations were made on 321 cases of this apparently new complaint, and after giving an admirable summary of its chief characteristics and drawing attention to the extraordinarily severe headache that was constantly present while the fever lasted, he gave a detailed account of the points in which it differed from the classical typhus fever so well described by Murchison and others 50 years ago. He laid stress on the complete absence of contagiousness characterising the new complaint; typhus fever, on the other hand, had always been notoriously catching. The new complaint, again, was practically never fatal; out of some 400 cases he had seen or collected only one had died. Typhus fever, on the other hand, was fatal to from 18 to 25 per cent. of the patients as a rule; in even the mildest of the typhus epidemics hitherto described the mortality had been as high as from 5 to 8 per cent. Owing to the lateness of the hour no general discussion of the paper could take place; but the upshot of the whole matter was that Professor Brill's disease may in all probability be set down as an unusually mild and benign form of typhus fever. The treatment of such fevers was better and more rational nowadays than it used to be in the older times, particularly in such countries as have well-organised fever hospitals and sanitary authorities. The importance of fresh air in preventing contagion was fully understood at the present time; and, finally, there was no doubt that the specific infectious fevers (of which typhus was one) might readily change their type and become attenuated in the course of time for reasons that they did not fully understand.

SECTION VII.—SURGERY.

WEDNESDAY, AUGUST 6TH.

President, Sir WILLIAM WATSON CHEYNE, Bart., C.B. (London.)

The section was opened by a short address of welcome from the PRESIDENT, who proceeded to speak of the great changes which had taken place in surgery since the last meeting in London 32 years ago. Of the 73 surgeons who then formed the council of the section only some 10 or 11 remained. He showed that many operations which are now commonplaces were in those days only beginning to attract attention, and he concluded with a eulogy of Lister and his work. He was followed by Dr. LUCAS-CHAMPIONNIÈRE (Paris), Professor Freiherr VON EISELSBERG (Berlin), and Professor BLOCH (Copenhagen), all of whom spoke in warm terms of the services rendered to surgery by Lister, and they mentioned their personal experience of him and his work.

On Operating on Exhausted Patients.

Dr. G. LE FILLIATRE (Paris) read a paper on the value of his method in operating on patients very exhausted or cachectic, with especial reference to gastro-enterostomy. He considered that the greater part of the shock in a severe operation was due to the anæsthetic, and therefore it was important to avoid a general anæsthetic as much as possible. He described the results of employing spinal anæsthesia, and mentioned that in 94 laparotomies there had been only four deaths, although in many of the cases severe visceral disease or great weakness had been present.—Professor DOLLINGER (Budapest) agreed that very extensive operations could be performed under local anæsthesia.—Professor VON EISELSBERG pointed out that with a general anæsthetic the mental effect of the operation was diminished.—Professor HARTMANN (Paris) mentioned that in abdominal operations the only pain was in the incision of the abdominal wall, and that on cutting the viscera no pain was felt.

Mr. HERBERT J. PATERSON (London) read a paper on

The Physiology of Gastro-jejunostomy.

He pointed out that at the present time the opinion was commonly held that the action of a gastro-jejunostomy was entirely mechanical, that it allowed the stomach to empty its contents more readily, and that in the case of a duodenal ulcer it prevented the passage of the gastric contents over the ulcerated surface. This theory could not, however, account for those cases in which there was no obstruction at the pylorus, or for those cases in which the ulcer was in the lesser curvature or near the cardia. He had proved by a number of examinations of the chlorides of gastric juice that the operation of gastro-jejunostomy reduced the total chlorides while it increased the fixed chlorides; these and other considerations showed that the action of the operation could not be merely mechanical, and therefore the operation was justifiable in cases without pyloric obstruction, and for cases of ulceration in any part of the stomach.

Dr. EDWARD ARCHIBALD (Montreal) read a paper on

A New Factor in the Causation of Pancreatitis.

He drew attention to the fact that while it was certain that pancreatitis was sometimes due to blocking of the papilla of Vater by a calculus, in many cases of this disease no calculus was present. By means of a number of experiments he had proved that a sphincter exists in the papilla of Vater, that it was capable of withstanding great pressure, and that spasm of it might be produced reflexly by irritation

from the stomach or duodenum. He further showed that this spasm could cause a fluid in the common bile-duct to pass into the ducts of the pancreas. Clinical evidence was also produced, and a number of slides helped to make the contentions of the author clear.

Dr. L. MEYER (Brussels) read a paper on

Transverse Incisions in Abdominal Surgery.

He claimed that transverse incisions gave better access to the abdominal contents, whether in the upper or the lower parts of the abdomen.

A paper on

The Elevated Head and Trunk Position in the Surgical Treatment of Abdominal Lesions,

by Dr. RUSSELL S. FOWLER (Brooklyn), was read in his absence by Professor J. A. POLAK (Brooklyn). The paper described the unsatisfactory results which had been obtained before 1900 with all the methods then employed. In that year the elevated position of the body was first adopted, and at once the results began to improve. While the duration after the onset of the peritonitis was of the first importance —for the earlier the operation was done the better—yet the elevated position was of great importance. One reason for this was the fact that in the upper part of the abdomen there were many stomata in the peritoneum; in the pelvis there were none, and therefore the risk of absorption of germs and their septic products was very much less. It was necessary to have a large glass drainage-tube passing to the base of the pelvis, and this should be aspirated every few hours. With the elevated position the respiration is easier, and pulmonary complications are less frequent.

Dr. WALTER F. BURROWS (New York) read a paper on

Post-operative Intestinal Stasis and the Intra-abdominal Use of Oil.

He held that adhesions form rapidly after operation on the abdomen, and that much of the discomfort and danger after such operations might be obviated by the introduction of oil into the peritoneal cavity. This opinion was based on a number of experiments on animals, and on one case in a human being. He had found that of all the substances which he had tried the best was a purified liquid petrolatum; it should not be too thin or it might diffuse too rapidly. Some six or eight ounces could be introduced without any harm; septic absorption was lessened, and adhesions had much less tendency to form.—In reply to Mr. W. G. SPENCER (London) he said that the oil was sterilised by boiling and then was cooled to the temperature desired.

Professor L. KRYNSKI (Warsaw) read a paper on

Cirrhosis of the Mesentery as a Clinical Entity.

He described a case which he had seen. The patient had had severe abdominal symptoms, and when the abdomen was opened it was found that the bowel was healthy and that no tuberculosis was present, but that the mesentery was greatly thickened so as to form a hard mass, and on microscopic examination it was discovered that there was a great increase in the amount of connective tissue present.

THURSDAY, AUGUST 7TH.

Professor R. BASTIANELLI (Rome) opened a discussion on

The Operative Treatment of Malignant Disease of the Large Intestine (excluding the Rectum).

He said that recently doubts had been raised as to the extent to which malignant disease of the bowel extended beyond the visible disease, and it appeared possible that more should be removed than was customary. The first point in the treatment as to which all were agreed now was that, as a rule, no radical treatment should be allowed during obstruction, but to this rule tumours of the cæcum were an exception. He considered it wise in all cases of obstruction of the large intestine to open the abdomen on the right side and to make an artificial anus in the cæcum, though if the growth were in the cæcum the ileum might be anastomosed to the sigmoid. He considered that a temporary artificial anus was much better in the cæcum than elsewhere, but the opening should be large. The risk of doing a primary resection of the large intestine was due to the fact that the anastomosis was more difficult than in the small intestine, and there was a chance of the blocking of the bowel with solid fæcal masses. Another point in favour of a cæcal anus was that it was easily closed when the time came. As to the results, since 1900 he had had 84 cases with a mortality of 60 per cent., but since 1905 there had been 44 cases and only two patients had died, a mortality of 4·5 per cent. Of 739 cases which he had collected the death-rate had been 26 per cent.

The discussion was continued by Professor Dr. W. KÖRTE (Berlin), who gave an account of the results of the various methods of treating malignant disease of the colon, and he drew the conclusion that in cases of acute obstruction colotomy was the best treatment, with later removal of the growth, and even in chronic forms the two-step operation was the safer, unless the conditions were very favourable. Moreover, the different anatomical conditions of the different parts of the colon required differences in the treatment. The ultimate results of removal of malignant growths of the large intestine were favourable. Of palliative operations entero-anastomosis and cæcostomy might be usefully employed.—Dr. A. L. SORESI (New York) described a method of bowel anastomosis which he had invented, and which saved valuable time in the operations on these new growths. It consisted essentially in using a core of rubber tubing with catgut loops to which were connected the stitches of a single layer of anastomotic mattress sutures. The operation could be completed in four minutes.—Mr. PATERSON laid stress on the need for thorough exploration of the whole abdomen in all cases where there was diminution in the hydrochloric acid of the stomach; in this way malignant disease of the bowel might be discovered in a very early stage. He urged that the surgeon should never refuse to operate because of the existence of enlarged glands. He was much in favour of a preliminary cæcostomy.—Sir FREDERIC EVE (London) presented the complete statistics of the operative treatment of malignant disease of the colon at the London Hospital during the years 1901 to 1911. There were 375 cases in all; and of these 61 per cent. were suffering from obstruction. Of 127 in which a colotomy was done the death-rate was 54 per cent. Immediate resection was done in 95 cases with a mortality of 48·4 per cent.; with secondary resection the mortality was 38·8 per cent. He was inclined to think that the three-stage operation was the safest. He had not found that the more extensive operations were necessarily more dangerous.—Mr. A. E. BARKER (London) expressed his entire agreement with the views enunciated by Professor Körte.—Professor KRYNSKI was in favour of immediate resection if the indications were favourable.—Mr. CHARTERS SYMONDS (London) thought primary resection undesirable. He agreed that it was often impossible to distinguish between inflamed and malignant glands. He was in favour of doing colotomy in the transverse colon in cases where the disease was left-sided.—Mr. SPENCER advocated strongly the claim of appendicostomy for the treatment of these cases; he urged that it was far superior to colostomy, for fæces or gas could not escape, while colostomy should be reserved for exceptional cases.

Dr. ANGELO CHIASSERINI (Rome) read a paper on

Some Experimental Researches on the Production of Inflammation of the Pituitary Body.

The gland was approached from the outer side, the temporal lobe being raised carefully, and it was found easy to reach the gland. The general symptoms produced by infection resembled those resulting from disease of the gland, though some days elapsed before the symptoms appeared.

Dr. F. H. ALBEE (New York) read a paper on

Bone Transplantation.

He had employed it for many conditions, but especially for caries of the spine. By means of a thin splinter of bone taken from the patient's tibia the spines of some of the vertebræ were fixed together. The results were very good.

Dr. JOHN B. MURPHY (Chicago) read a paper on

The Clinical Results of Arthroplasty and Osteoplasty.

He showed numerous illustrations exhibiting the beneficial results he had obtained in cases of ankylosis of joints by the interposition of a layer of fat and fascia between the bony surfaces.—Mr. R. MILNE (London) spoke in favour of the excellent results he had seen in Dr. Murphy's clinic.

Dr. MAUCLAIRE (Paris) read a paper on

Bony and Articular Grafts.

He described cases in which he had employed bone grafts to repair loss of bone in various sites, with good results.

Dr. H. ECKSTEIN (Berlin) showed many illustrations of cases in which he had employed hard paraffin in repairing deformities. Some of the results were very striking.

Professor R. MINERVINI (Naples) read a paper on

The Practical Value of Free Grafting of Skin from the Fœtus and New-born.

The skin is taken from a new-born child, even 12 hours after death; the fat and connective tissue are removed, and the skin is cut into square pieces and applied to the surface to be grafted.

FRIDAY, AUGUST 8TH.

Professor VICTOR ROCHET (Lyons) opened a discussion on

The Diagnosis and Treatment of Early Renal and Vesical Tuberculosis.

He stated that there was no evidence that a miliary tuberculosis of the kidney existed, but it was quite possible. He was not in favour of operating on those early cases in which the only evidence of tuberculosis was the presence of bacilli in the urine; it was well to wait for pyuria, and the evidence of a lessened excretory power in the kidney, or for some important complication, such as severe hæmorrhage or pyrexia. In stages earlier than this general treatment was indicated. When both kidneys were affected operation was not indicated unless there was evidence that in one kidney there was some severe lesion threatening life. With regard to bladder tuberculosis, if this was consecutive to tuberculosis of the kidney, then the kidney must be treated, and when that was cured the bladder would generally be cured also. In the same way when the vesical tuberculosis was secondary to disease of the genital organs in the male these must be treated. In the very rare cases when the bladder was primarily affected general treatment was indicated when the disease was early and only when the bladder disease was severe was local treatment to be employed.

Dr. HANS WILDBOLZ (Berne) continued the discussion. He pointed out the great difficulty of recognising very early cases of renal tuberculosis; in fact, when it could be recognised with certainty the disease was already somewhat advanced. He held that the best treatment in all cases of unilateral tuberculosis of a kidney was the removal of the affected organ as soon as possible, and that general treatment was only justifiable in those cases in which the patient refused operation.

Dr. A. FULLERTON (Belfast) believed that renal tuberculosis was in most cases unilateral for a long time, and that in almost all cases of vesical tuberculosis the kidney was the site of the primary disease.

Professor H. KÜMMEL (Hamburg) held that tuberculosis of the urinary system nearly always started in the kidney, and that it was limited to one side for a time; that removal during such a stage was the best treatment.

Dr. G. VAN HOUTUM (The Hague) had a high opinion of the value of the local treatment of tuberculosis of the bladder. He employed one or two cubic centimetres of a solution of nitrate of silver of a strength of ½ to 2 per cent.

Mr. C. A. LEEDHAM-GREEN (Birmingham) thought that it was very difficult to estimate the stage of the disease, and he was inclined to think that we should not be in too great a hurry to remove the kidney.

Dr. DAVID NEWMAN (Glasgow) held that tuberculosis always began in one kidney and descended. He had the greatest opinion of the value of a cystoscopic examination, but experience was needed to interpret what was seen. When the ureteric orifice in the bladder was normal it might be taken that the corresponding kidney was normal also. Some valuable illustrations were shown to illustrate his contribution to the debate.

Professor ROVSING (Copenhagen) expressed the opinion that it was extremely rare for the surgeon to see tuberculosis in an early stage; it was only if the disease was detected when a man was examined for life-insurance that the disease was seen really early. He had a very small opinion of the value of tuberculin.

Professor E. HURRY FENWICK (London) believed that it was possible to recognise early tuberculosis of the kidney, sometimes as early as the third week. He had a high opinion of tuberculin, hardly as a true curative agent, but rather as a tonic. Early removal of the kidney was the best treatment, and it had a mortality of only 8 per cent.

Dr. A. L. SORESI (New York) read a paper on

What is the Value of Direct Transfusion of Blood? Its Indications and Technique, with Reports of over 600 Cases.

He laid stress on the importance of choosing suitable cases; it should be employed only in cases in which it was required to give time for the blood-making organs to do their work. Most of his cases had been done for hæmorrhage; it was advisable to give saline solution first, while the preparations were being made for the blood transfusion. When it was done for poisoning by illuminating gas it was advisable to remove some of the impure blood before introducing the fresh blood. The main point about the technique was that intima must be brought into contact with intima, and he showed an ingenious form of apparatus for accomplishing this. Further, the vessels must be kept moist with saline solution during the whole of the time the blood was passing. The best vein for the donor was the ulnar, and the best vein of the recipient was the external jugular.

Dr. CHARLES BORSZEKY (Budapest) read a a paper on

The Prevention of Hæmorrhage in Operations on the Liver.

The method he employed consisted in the use of a clamp applied to the edge of the lesser omentum so as to control the hepatic artery and the portal vein. The method had been employed in 11 cases, and nine of these had recovered. It appeared to be advisable that the blood stream should not be arrested for more than an hour.

Mr. ARTHUR H. EVANS (London) showed a patient from whom he had removed an

Extensive Carcinoma of the Larynx.

The patient was a woman 39 years old, and the growth had involved so much of the œsophagus as to make it necessary to remove it as far down as the upper border of the sternum. A rubber tube had been fixed into the cut end of the pharynx, and it was also fastened into a gastrostomy opening; the patient was able to take the food by the mouth, and it passed by the tube into the stomach. The operation was performed four years ago and she was still in good health.

Dr. ERNEST LAPLACE (Philadelphia) read a paper on

Arterio-thrombosis and Thrombo-phlebitis of the Mesentery.

He held that all these cases were infective in origin, even though there was no marked pyrexia, and he had performed experiments which supported this opinion. He had found the greatest value in the use of a solution of citric acid (1 in 500) for proctoclysis by Murphy's method, at the rate of 40 drops a minute. It produced a marvellous reduction in the septic manifestations.

Sir FREDERIC EVE (London) had seen a case of mesenteric thrombosis in which there had been no gangrene of bowel.

Mr. E. W. HEY GROVES (Bristol) inquired as to the theory on which the citric acid had been used, and he wished to know whether it had caused any hæmorrhage.

Dr. LAPLACE, in reply, said that he used the citric acid as an agent for restraining septic processes; he had had no hæmorrhage.

Dr. CHARLES GOODMAN (New York) read a paper on

Arterio-venous Anastomosis for Impending Gangrene; a Report of 15 Consecutive Cases with Arterio-venous Anastomosis of the Femoral Vessels.

The opportune time for intervention was in the pregangrenous stage, though it might be done a little later. The utmost care was necessary to prevent the formation of thrombi. The end-to-end operation appeared to be the simplest. The results so far obtained warranted him in believing that gangrene could be prevented if the operation was not left too late.

Dr. PUJOL Y BRULL read a paper on Gangrene of the Bowel as a Result of Obliteration of the Mesenteric Vessels.

Dr. KEPPICH (Budapest) exhibited and explained the mode of use of Huttl's Stitching Instrument, which inserts a double row of staples to close the bowel or stomach in resection. The instrument worked extremely well.

SECTION VIII.—OBSTETRICS AND GYNÆCOLOGY.

THURSDAY, AUGUST 7TH.

President, Sir FRANCIS H. CHAMPNEYS (London).

The PRESIDENT briefly welcomed the members and forthwith called on Professor DÖDERLEIN (Munich) and Professor ESSEN-MÖLLER (Lund) to introduce their reports on

The Treatment of Hæmorrhage from the Placental Site in the Later Months of Pregnancy.

The natural tendency for this subject to fall into two divisions (placenta prævia and accidental hæmorrhage) was accentuated by the decision of the reporters to choose one division each. This arrangement gave, it must be admitted, rather a disjointed effect to the discussion. It was perfectly clear, however, that the section was unanimous in dividing cases of hæmorrhage into two groups for purposes of treatment—viz., (1) those for whom the facilities of a hospital were available, and (2) those where these were impossible or refused. Almost every speaker urged this distinction, and many insisted that all cases of hæmorrhage were as clearly cases for treatment in hospitals or nursing homes as any acute surgical condition.

Professor DÖDERLEIN, in his discussion of placenta prævia, conferred a boon by his grouping in statistics of a very large number of cases. These included series by the following methods: (1) Artificial dilatation by bags; (2) tamponade of the vagina; (3) Braxton Hicks; (4) intra-amnial metreuryse; (5) abdominal Cæsarean section; and (6) vaginal section. He favoured operative measures (particularly vaginal Cæsarean section) where facilities were possible, but was still prepared to keep an open mind on the whole question.

Professor ESSEN-MÖLLER, who limited himself to the pathology and treatment of accidental hæmorrhage, referred to the recent discovery that, frequently at least, the muscle was the site of the hæmorrhage. He considered that a small group of cases was directly attributable to trauma, but that by far the larger group had an association with albuminuria such as to suggest some general intoxication. He drew comparisons between eclampsia and accidental hæmorrhage, particularly in regard to the albuminuria and hæmorrhage. For treatment he advocated Cæsarean section (abdominal or vaginal) for serious cases with closed cervix where the condition made rapid delivery necessary; hysterectomy was only to be done when contraction remained obviously deficient after removal of the child and the placenta. He doubted the efficacy of the Rotunda method, and in moderate cases would try the effect of rupture of the membranes.

So far as the discussion related to placenta prævia there appeared more or less a consensus of opinion that the Braxton Hicks method for most cases and Cæsarean section for severe cases with closed cervix gave the best prospects.—Professor J. M. MUNRO KERR (Glasgow) urged that the latter should not be postponed till late.—Professor MURDOCH CAMERON (Glasgow) was by no means enthusiastic over Cæsarean section, but Professor RECASENS (Madrid) was sufficiently convinced of its merit to have done it where the child was dead.—Professor R. JARDINE (Glasgow) recommended pituitary extract for all cases of hæmorrhage, but Professor DE LEE (Chicago) pointed out that there was a danger of rupture of the uterus following this drug.—Professor E. P. DAVIS (Philadelphia) regarded the condition as being essentially similar to ectopic gestation and therefore treated it on surgical lines. He had had 14 Cæsarean sections with recovery of all the mothers and of all the viable children.—Professor PAUL BAR (Paris) and several others called attention to the possibility of an aggravation of the shock following section cases.

Discussing accidental hæmorrhage, Sir JOHN BYERS (Belfast) remarked that, when concealed, it gave rise to an appearance suggesting "something behind the bleeding." He thought that rupture of the membranes was bad if it delayed labour, and recommended the Rotunda method of packing, pituitary extract, and isotonic salines.—Professor JARDINE described two cases of concealed hæmorrhage where the condition was too serious for section, and yet the patients recovered under pituitary extract, salines and morphia; such cases pointed a moral.—Dr. E. HASTINGS TWEEDY (Dublin) described thorough plugging of the vagina and its fornices as being invariably successful in arresting hæmorrhage by pressing on the big vessels; the patients, however, might still be in danger.

Professor DÖDERLEIN and Professor ESSEN-MÖLLER briefly replied.

Afternoon Session.

At the afternoon session several interesting papers were communicated. Professor FRITZ FRANK (Cöln) spoke strongly in favour of subcutaneous symphysiotomy, and was supported by Professor MUNRO KERR.

Professor DAVIS advocated surgical intervention (nephrotomy) in cases of pyelitis of pregnancy resisting ordinary medicinal treatment. He was against the induction of labour, which might still further light up the infection.

Professor FABRE (Lyons) described his method of external hysterography. By means of a very simple apparatus he had studied the uterine contractions in pregnancy, labour, and post-partum. Different types of contraction had been noted, and it had been found possible to foretell the type of contraction in labour. The action of drugs had also been studied with ease.

A short paper by Professor RECASENS, on Homologous Organotherapy in Certain Gynæcological Complaints—i.e., the injections of preparations of human ovaries obtained mainly from operations for fibroids, and one by Professor P. NUBIOLA, on Electrographic Observations during Pregnancy, followed and brought the session to a close.

SECTIONS VIII., X., AND XVIII.—OBSTETRICS AND GYNÆCOLOGY, DISEASES OF CHILDREN, AND HYGIENE.

FRIDAY, AUGUST 8TH.

President, Dr. ARTHUR NEWSHOLME (London).

A very important debate took place on

The Causes of Death among Infants during the First Four Weeks after Birth.

Three reporters introduced the discussion, Dr. A. K. CHALMERS (Glasgow), Dr. H. KOPLIK (New York), and Professor V. WALLICH (Paris).

Dr. CHALMERS'S contribution was largely statistical. He pointed out, firstly, that the deaths under one month formed almost one-third of the total deaths during the first year; secondly, that those occurring in the first week made up one-half of those occurring in the first month. It appeared that two-thirds of these deaths within a month could be ascribed to causes suggesting cell deterioration in the antenatal stage. He grouped such under the general term of "immaturity." They represented children who in a very literal sense might be said "to be born to die." Data appeared to suggest a strain of inefficient preparation for motherhood, or of inability on the part of one or other parent to beget healthy children, which was independent of surroundings and knew no geographical boundaries. Further tabulation of the causes of death in the days and weeks of the first month was urgently necessary for our further information. Statistics showed that the death-rate from prematurity and wasting diseases in the first three months of life was much less elastic than the rates for the third to the sixth month, and the sixth to the twelfth month. He was of the opinion that the gynæcologist must be looked to for some elucidation of the problems suggested. A sex variation, an age-period variation (under 20 and over 40), a relation to employment of the mothers and to social conditions in general, were clearly demonstrable. In conclusion, he was firmly convinced that nature and not nurture was at fault.

Dr. KOPLIK affirmed that the mortality under discussion was intimately connected with prenatal influences, and that the first month of extra-uterine existence was closely allied to the history of the fœtus in utero. Syphilis in statistics did not give a large quota of deaths, but this was probably due to difficulty of diagnosis. Obstetrical difficulties, the feeding of the infant, the legitimacy of the infant, and the social position of the parents were all discussed. He considered that 60 per cent. of this deplorable mortality was due to neglect, ignorance, and poverty; prematurity alone would not account for a death, but prematurity and exposure would. Prematernity hospitals and instruction were a necessity; expert artificial feeding was preferable to wet nursing; and the education of the physician in obstetrics was not yet complete.

Professor WALLICH produced interesting statistics showing the variation between legitimate and illegitimate cases, and

between home-nursed infants and those put out to nurse. The mortality from obstetrical reasons was improving, but much remained to be done in correcting detrimental social conditions.

A long and interesting discussion followed. Professor VEIT and Dr. A. L. MCILROY (Glasgow) emphasised the important of a syphilitic taint. The latter in a series of 100 unselected cases in an out-patient department had found 49 per cent. giving a positive Wassermann reaction.

Sir FRANCIS CHAMPNEYS (London) insisted that the physician must make it fashionable for mothers to nurse their children. Schools for prospective mothers would in the end prove a cheap investment for the State.

Dr. AMAND ROUTH (London) was anxious that registration of stillbirths should be made compulsory all over the country.

Sir JOHN BYERS (Belfast) had tried unsuccessfully to get the maternity benefit so arranged that one condition of its payment was that the patient should regularly report herself during pregnancy.

MRS. SCHARLIEB (London) urged the responsibility of women doctors in persuading pregnant women to submit to more thorough investigation, mothers' clubs were of incalculable value, and doctors and nurses were much to blame for suggesting substitutes for breast feeding.

Professor DE LEE (Chicago) insisted that the pathological dignity of labour among civilised women should be admitted.

Dr. T. W. EDEN (London) hoped for the reinstitution of wet nursing on a large scale; there was no equivalent substitute for mother's milk.

Professor J. M. MUNRO KERR (Glasgow) and Miss ALICE WINTER considered that pregancy should be made notifiable, so that efficient prematernity supervision could be given, and the reporters briefly replied.

In the afternoon session of the Section of Obstetrics Professor POZZI (Paris) described his operation (stomatoplasty) for opening up stenosed cervices associated with sterility, and was enthusiastically supported by Dr. H. R. SPENCER (London), who regretted that this operation had not received more recognition in England and America.

Professor BEUTTNER (Geneva), for chronic inflammatory diseases of the appendages where it was possible to preserve one ovary, recommended an original operation whereby a wedge of uterine fundus was removed in one piece with the adnexa; the patient was thus left with the possibility of menstruation.

Dr. A. L. MCILROY (Glasgow) discussed some factors influencing the mammary secretion, and was constrained to limit such to the ovary. She had failed clinically to confirm Schäfer's experimental work on the galactogogue action of the pituitary gland.

SECTION IX.—OPHTHALMOLOGY.

WEDNESDAY, AUGUST 6TH.

President, Sir ANDERSON CRITCHETT, Bart. (London).

The PRESIDENT, in his address of welcome to the large gathering of ophthalmologists from every part of the world that filled the great room assigned to the section, said that their feeling of pleasure at this notable gathering must be tinged with a deep regret that the man who had been chosen as the *doyen* of their art and as the president of this section was no longer with them. Sir Henry Swanzy had passed from amongst them, but his name was inscribed in their hearts on the list of those whom it delighted them to honour. No one regretted their loss more than himself, for to him the loss was not only that of a distinguished colleague, but of a life-long friend. Considering the matter to which their attention would be directed in the doings of the section, the President said it was of interest to review the changes that had come over their work since the last similar meeting. New methods of diagnosis had been found—to wit, the Wassermann test, with its great possibilities—and a greater knowledge and ease of distinction of the organisms found in conjunctivitis. There had been developments in those adjuncts to diagnosis which came through sister sciences, and none was more valued than the X rays as aids to the location of foreign bodies in the eye and its adnexa; by means of this alone many eyes were now saved that were formerly lost. With the neurologist they had learned much of the conditions of disease of the pituitary body, and a whole new literature of cases illustrative of this organ in its relation to the eye and the body generally had grown up. Further, their work had brought them into relation with the dental surgeon, for it was increasingly recognised how extensive was the influence on the eye of dental conditions that could be relieved by the work of those cunning craftsmen. In their own particular domain they had new methods of diagnosis and treatment. In the tension of the eye their judgment by tactile sense could now be supplemented by delicate manometers; that was a great gain. In the treatment of glaucoma they had new modes of operation which had greatly changed their view of the prognosis of the disease, and for these gains they had to thank Lagrange, Priestley Smith, Herbert, Freeland Fergus, and Elliot. The improvement in the forms of cautery available had facilitated the treatment of grave corneal conditions, of conical cornea, and ulcers. Some of the newer methods were still in a state of flux; for example, the valuation put on subconjunctival injections was varied in the extreme; by some they were lauded as perfection, and by yet others they were held to be utterly worthless; there was need for the balancing of these extremes. Radium also had come, but its value was as yet indeterminate. Their reflections on the experiences of the past must be that there was no finality in their work; they held the seed of the future in their hands, but as yet they still, like Moses, viewed the promised land from afar.

Professor DE LAPERSONNE (Paris) read a paper on

Dermoid Cysts of the Fronto-orbital Region.

He detailed the conditions of some cases of complicated dermoids which appeared to be encapsulated in a thin, bony case in the upper part of the orbit and which had two points of projection beneath the skin, the one below the brow, the other above in the frontal region. It appeared that the penetration of the cysts into the orbit was a secondary feature. The utility of the X rays in distinguishing these cases from frontal sinusitis was great.

Professor E. FUCHS (Vienna) and Professor GOLOVLIN (Moscow) discussed the paper.

Professor W. UHTHOFF (Breslau) read a paper

On the Recovery of Intracranial Tuberculosis with Coincident Eye Affection.

The eye symptoms were particularly associated with tuberculous meningitis. Several cases were detailed. In conclusion, he said that only about 2 per cent. of the cases with meningitis recovered. Lumbar puncture held out the best prospect of relief.

Professor Dr. ZUR NEDDEN (Düsseldorf) read a paper on

Multiple Pneumococcal Infections of the Cornea.

Corneal ulcers due to the pneumococcus had been held to be of single origin in the same cornea; recently he had seen two cases of lacrymal disease in which numerous small infections of the epithelium that passed into serpiginous ulcers of the usual severity.

The paper was discussed by Professor SATTLER (Breslau).

Dr. A. ANTONELLI (Paris) described and showed photographs of a rare case of Naso-lacrymal Periostitis with Symptoms of Leontiasis Ossea in Inherited Syphilis.

THURSDAY, AUGUST 7TH.

Professor ERNEST FUCHS (Vienna) and Professor DE SCHWEINITZ (Philadelphia) opened a discussion on

The Pathogenesis of Chronic Uveitis, excluding Syphilis, Tuberculous, and Sympathetic Varieties.

Professor FUCHS dealt with the subject from the pathological findings. He said that in these cases there was a distinct gradation of effects. In the least precipitates only were noted; in others synechiæ of the iris appeared; in yet others the process was so severe as to cause ultimate shrinkage of the globe. The anatomical characters differed in these cases both in degree and kind, and the evidence showed that in the lesser severity the irritation was due to toxins, whilst in the graver there was a direct bacterial infection.

Professor DE SCHWEINITZ said that the evidence at their disposal suggested that there was no basis for the supposition of the existence of a rheumatic iritis, but that uveitis occurring in the subjects of various forms of polyarthritis was due to the same cause as produced the joint affections, and that was unknown. It was probable that gout did induce a chemical irritation of the uveal tract. There was

evidence that most cases of uveitis were the direct result of bacterial infection or were set up by their toxins; particularly was this true of the gonococcus and staphylococcus. The former caused many of the so-called rheumatic cases. The latter was associated with other affections of the mouth, pharynx, nasal sinuses, uterus, and skin. In most cases he thought the uveitis was caused by the direct invasion of the organism modified by its transmission through the blood stream. Dealing with the idea of auto-intoxication, he said that there was no evidence that the body tissues produced poisons; the cause was intoxication from bacterial products. The study of the chemical constituents of the urine afforded a field for the elucidation of metabolic irregularities, and seemed likely to lead to the establishment of a definite group of diseases of the uveal tract called into existence by infections of bacterial origin arising in the intestinal tract.

Professor AXENFELD (Freiburg) said that it was exceedingly difficult to exclude tubercle as the cause of uveitis, post-mortem examinations were not conclusive unless microscopic investigations were thorough. He believed that this was a much more common cause of uveitis than was commonly supposed.

Professor A. ANGELUCCI (Naples) maintained that most cases of myopic choroiditis were due to chronic intestinal sepsis.

Dr. E. FRANKE (Hamburg) spoke, and Professor FUCHS in reply acknowledged that the difficulty of the exclusion of tubercle was extreme; the microscope would not exclude it; inoculation was alone sufficient. But they had a really definite line of distinction in the character of the changes produced by the various irritants.

Professor DE SCHWEINITZ reiterated his conclusion that the evidence was all in favour of bacterial effects and not in the production of poisons by the body itself.

Professor ANGELUCCI read a paper calling attention to the variation in the incidence of conjunctivitis according to season in Europe and Egypt. In Europe the cases were proportional to the rise of the temperature, and they had one maximum peak for the year; in Egypt it appeared there were spring and autumn peaks, and for this there was no adequate explanation.

Experiments on Animals.

Mr. J. B. LAWFORD (London) read a resolution as follows:—

That this section records its conviction that experiments on living animals have proved of the utmost service to medicine. That accordingly, while strongly deprecating the infliction of unnecessary pain, it is of opinion, alike in the interests of man and of animals, that every facility should be given to competent persons for the performance of such experiments under adequate supervision.

The resolution was carried unanimously; there were about 230 members present.

Mr. ERNEST CLARKE (London) read a paper on

The Influence of Age on Accommodation.

Referring to Donders's work, which was their standard reference, he showed that in 3000 cases collected by himself the accommodation was rather better age for age than that found by Donders. Part of the difference he thought due to the fact that in these times refractive errors were better eliminated by the use of efficient cycloplegics. Low accommodative power was a sign of premature senility, and frequently associated with intestinal stasis.

Other Papers.

Mr. A. F. MACCALLAN (Cairo) read a paper on Ophthalmic Progress in Egypt (printed on p. 470), and showed what strides had been taken since 1903, under the stimulus of the gift for the foundation of hospitals by Sir Ernest Cassel.

Mr. J. BURDON-COOPER (Bath) read a paper in which he described experiments directed to determine the physico-chemical changes in the crystalline lens in senile cataract. He showed that there was a constant presence of tyrosin in the cataractous substance, and in the aqueous after extraction, and that this substance could be produced by hydrolysis of the healthy lens substance. He concluded that the cataractous change was a hydrolysis.

Professor SALZER (München) read a paper on the Processes of Regeneration of the Cornea after Wounds. The first healing process was due to the proliferation of the surface epithelium, then followed activity in the keratoblasts for the reproduction of the proper substance, and lastly the elastic layer of Descemet was replaced.

Professor WICHERKIEWICZ (Cracow) described a Modification of Pannas' Operation for the Relief of Ptosis of the Upper Lid, and showed photographs of cases operated upon.

Professor RICHARD GREEF (Berlin) detailed new methods of preparing and mounting eye specimens so as to preserve the natural colours.

Dr. JOHN M. WEST (Baltimore) described his method of treating by operation Dacryocystitis by the intranasal resection of the bone adjacent to the lacrymal sac and removal of that part of the sac exposed. He said that the method gave an absolute cure, with full restoration of the drainage of the eye.—The paper was discussed by Dr. POLYAK (Budapest), Professor SCHIMANOWSKI (Kief), Dr. J. E. WEEKS (New York), and Colonel ELLIOT, I.M.S.

Professor W. STOCK (Jena) read a paper on the Blood-count in Tuberculous Affections of the Posterior Region of the Eye.

Dr. MAGITOT (Paris) described a method of restoring transparency to the cornea after lime burns or ulceration had produced dense and unsightly leucomata. He trephined the area down to Descemet's membrane and replaced it by clear corneal tissue removed from another subject or from the same eye of the patient. Transparency of the grafted tissue persisted and vision was improved.—Professor SALZER discussed the paper.

SECTION XIII.—DERMATOLOGY AND SYPHILIGRAPHY.

WEDNESDAY, AUGUST 6TH.

President, Sir MALCOLM MORRIS, K.C.V.O.

The PRESIDENT opened the proceedings by an Address. He began by offering a hearty welcome to the foreign dermatologists, and then proceeded to trace the changes that had taken place in the importance of this branch of medicine since the 1881 Congress. Then dermatology was a science of little account, and an inspection of the 1881 proceedings showed a lack of interest and importance in the programme. The only notice bestowed on bacteriology was contained in a paper on Some Desquamative Diseases of the Skin. A gallant attempt was made to show that psoriasis, papular eczema, and molluscum contagiosum were all of bacteriological origin, and due to the same organism. No one, however, appeared to realise the important place bacteriology would take in the diseases of the skin. Turning from the etiology to the diagnosis and treatment of skin diseases due to bacteria, many triumphs had to be recorded. The elaboration by Wassermann, Neisser, and Bruck of the serum reaction for syphilis had enabled a correct diagnosis to be arrived at in cases of great difficulty, while in tuberculosis there were available the tuberculin reactions. In the therapeutics of syphilis the labours of Ehrlich and Hata had given salvarsan, the most important contribution which synthetic chemistry had ever made to medical science. Turning from the bacteriological to the fungous diseases, a tale of progress was again to be recorded. Although Gruby had long ago recognised the ringworm fungi his work had been forgotten, and not until 1891 was the thread picked up again, and had chiefly been elaborated by Sabouraud in France and Colcott Fox and Adamson in this country. Another notable advance in dermatology was the recognition of the importance of the ductless glands, while X rays and radium were of enormous use in a great variety of cutaneous affections. The greatest emphasis should be laid on the importance of the discussion on the treatment and prevention of syphilis, held jointly with the Section of Forensic Medicine in the Albert Hall. No greater service could be done alike for medical science and mankind than to urge upon governments the imperative necessity of taking systematic and thorough and vigorous action to suppress one of the greatest scourges of the human race. Let the blow be struck and with no faltering arm; then in the years that remain each would be able to look back on the Seventeenth International Congress of Medicine with profound and lasting satisfaction.

THURSDAY, AUGUST 7TH.

The proceedings for the day opened with a display of cases, many bearing on the subject under discussion for the morning.

After this Dr. J. DARIER (Paris) began a discussion on

Epithelioma of the Skin, Benign and Malignant,

with a paper in which he considered very fully the different types and their relationship. He emphasised the epithelial

origin of the nævus cells. In treatment he was guided by the form the malady took. Rodent ulcer could be cured by X rays, cauterisation, &c. Epithelioma, on the other hand, should be attacked by surgical methods, and no other. Electrolysis could be satisfactorily employed for the simple nævo-carcinomas.

Professor J. A. FORDYCE (New York), who spoke next, exhibited a series of beautiful lantern slides illustrating rare tumours of the skin and their pathological appearances.

Professor J. JADASSOHN (Berne) followed, and classified benign epithelial neoplasms of the skin into groups according to their etiology. He recognised an infectious type, including molluscum contagiosum and warts, a chemical, due to tar, &c., a mechanical (corns), and an actinic (X rays).

These three reporters were followed by a number of speakers who contributed shorter papers. Dr. W. DUBREUILH (Bordeaux) made a point of the parasitic nature of the cancer cell. He agreed with Dr. Darier as to the epithelial nature of nævus cells. In treatment X rays should be employed in massive doses where this agent was applicable.—Dr. G. CIARROCCHI (Rome) employed a glycerin-arsenic mixture in benign epithelioma. This mixture was difficult to prepare, but was superior to other arsenical pastes in that it did not cause undue pain or inflammation. Its action was more gradual and more thorough, and the application required no special skill. In their communication Dr. J. NICHOLAS and Dr. FAVRE (Lyons) described certain granules and filaments found in carcinomatous tissues where special fixing and staining methods had been employed.—Dr. G. NOBL (Vienna) had treated epithelioma successfully by mesothorium.—Mr. J. MCDONAGH (London) divided cutaneous epitheliomata into three classes—epidermic, appendicular, and mixed epidermic-appendicular. He recognised intermediate forms and the close relationship of the three groups.—The early recognition of carcinoma and the education of the lay public furnished Professor T. C. GILCHRIST (Baltimore) with a theme. Many of the inoperable carcinomas were the result of neglect of early cases. He quoted Dr. Bloodgood's dictum that it was worse to operate incompletely on an early cancer than to operate completely on one in an advanced condition. Not only the public but the family doctor should be impressed with the importance of recognising the early stages of malignant disease.—Dr. E. SAALFELD (Berlin) spoke of the utility of mesothorium, while Dr. K. ULLMANN (Vienna) discussed arsenical cancer. He inquired if any member had met with this condition following salvarsan.—Dr. UNNA (Hamburg) was pleased to know that his French colleagues supported his view as to the epithelial nature of nævus cells. He discussed the stimulating effect of pigment on the cutaneous cells.

Afternoon Session.

In the afternoon there was a further demonstration of cases.—Professor PETERSEN (St. Petersburg) described his success in three cases of undoubted Blastomycosis with salvarsan. From one to four injections were required to effect a cure.—Psoriasis received minute attention in a paper by Professor PEYRI Y ROCAMORA. He emphasised its close relation to certain other dermatoses, and regarded it as a reaction of the individual to various different stimuli, and not as an independent disease. It was important to recognise the various types as each had its special therapeutic indications.—The interest of this paper was enhanced by Dr. ALLAN JAMIESON'S remarks: he believed in the toxic nature of psoriasis.—Dr. SAALFELD again contributed an interesting paper on the Histology of Multiple Skin Tumours, and Dr. J. G. TOMKINSON (Glasgow) recorded good results in Lupus Vulgaris by combining X rays and caustics.—The paper of Dr. MEIROWSKY demonstrated the asexual reproduction of the spirochæta pallida. He had discovered by staining and the "dark ground" method the appearance of terminal and lateral nodes, from which new organisms are produced.

There were other interesting papers on the agenda: Dr. R. CRANSTON LOW (Some Peculiar Chronic Ulcerative Skin Lesions), Dr. HEIDINGSFELD (Anonychia Congenitalis Totalis), Dr. FAVRE, Dr. NICHOLAS, and Dr. REGAUND (Contribution on the Sweat and Sebaceous Glands), and Lymphogranulomatosus Inguinalis Subacutis, by Dr. DURAND, Dr. FAVRE, and Dr. NICHOLAS.

FRIDAY, AUGUST 8TH.

In the morning session the section passed unanimously a resolution in favour of experiments on animals.

A discussion was then opened on

Alopecia Areata and Allied Conditions.

Dr. R. SABOURAUD (Paris) declared himself in favour of the view that alopecia was a non-microbic and non-contagious malady. The etiology was quite obscure, and he thought Jacquet's observations on the reflex origin from decayed teeth, &c., only explained some cases. The association of changes in the nails and the frequent symmetrical distribution pointed to a general rather than a local cause. He called attention to the tendency to relapse, to the association with congenital syphilis, and to the fact that the disease was often a familial one. He thought it better to observe facts than to evolve theories.

Professor C. PELLIZZARI (Florence) regarded alopecia as a symptom, not as a disease. He considered it of nervous origin and of various causation. He thought the same hypothesis explained the etiology of many allied conditions.

Dr. L. BULKLEY (New York) had for a long time urged that alopecia areata was not due to local infective causes, and was not contagious. He was convinced that various reflex irritations were capable of starting the disease. In his experience alopecia was equally common in men and women. As he had observed that the eyebrows and eyelashes, where treatment could not be applied, were the first to recover in extensive cases, he was inclined to lay most stress on internal methods, and he gave carbonate of iron in drachm or larger doses thrice daily. It was important to pay attention to the general condition.

In the absence of Dr. PETGES and Dr. MURATET (Bordeaux) their communication was read by Dr. DUBREUILH. They had examined a large number of cases by the Wassermann test, but believed that the rôle played by syphilis was negligible.

Dr. CIARROCCHI pointed out in a paper which he read that he had observed after furunculosis and folliculitis of the scalp a subsequent alopecia, which when the evidence of the preceding inflammatory condition had disappeared, left what appeared to be a true alopecia areata. It was this tpye that gave rise to the epidemics. If seen early these cases could be diagnosed by the small red central cicatrix, but later this disappeared, and then a false conclusion might be arrived at.

Dr. NOBL considered that hereditary or acquired syphilis was only one of many causal factors in alopecia. Otherwise it had no direct relationship.

Sir DYCE DUCKWORTH (London) did not believe in the bacterial origin of alopecia. He had not come across any contact cases, and he thought that where epidemics were described some other disease was really present. The depressed and shiny appearance of the patches, very like the "glossy skin" in cases of neuritis, was in favour of neurotrophic origin. He did not find the condition common in Graves's disease, and in this opinion he was supported by Mr. Berry. In the treatment he gave arsenic and fatty foods; locally, a rubefacient.

Professor ARTHUR WHITFIELD'S (London) remarks covered a large field and brought out many interesting points. He also thought alopecia rather a symptom than a disease. He had encountered the condition after severe pediculosis capitis and also after mastoid operations. It was very important in cases associated with severe headache to attend to the eyes. When errors of refraction were corrected the hair often grew again.

Dr. J. H. SEQUEIRA (London) had taken 50 cases and had made charts of both the scalp and teeth. In a control series he had encountered the same dental phenomena without bald patches, so that he could not quite confirm Jacquet's views. In another series of 50 cases three gave a positive Wassermann reaction. He believed there might be a small group of cases which were of contagious origin. This view of the contagious nature of some cases was also held by Professor JADASSOHN.

Afternoon Session.

Dr. BELLOT, Dr. DEGRAIS, and Dr. L. WICKHAM (Paris) recorded observations on the action of radium on certain warty conditions. Where these were of a superficial nature, as in the case of plane warts, radiations of little penetration were satisfactory, but if of a deeper character then more penetrating rays should be employed.

Radium had proved very useful in the painful warty conditions of the sole.

Mr. A. E. HAYWARD PINCH showed a series of most striking photographs illustrating the curative effect of radium. He employed a pure radium salt and in three strengths. One of the most difficult conditions to treat was the "port-wine" mark; the best results were obtained with weak applications. In the case of rodent ulcer one massive dose should be given, and this alone often effected a cure. Lichenification of the skin in neurotic subjects was also amenable to treatment. The pruritus and discomfort rapidly disappeared. Radium was of great value in cases of keloid, an excellent cosmetic result being obtained.

Dr. DUBREUILH had employed X rays with marked success in the painful warty conditions of the sole.

In an extremely careful paper Dr. OPPENHEIM and Dr. WECHSLER (Vienna) described the results of tuberculin inoculation (von Pirquet's reaction) in the skin of patients suffering from various skin diseases. The percentage of positive reactions remained about normal in local dermatoses; it was greatly increased in lupus vulgaris, while in florid secondary syphilis the number of positive reactions fell well below the normal. They thought that this change was the result of an altered sensibility of the skin in these various conditions to tuberculin.

Many other interesting communications were made. Dr. GEORGE PERNET (London) recorded a case of Mycosis d'Emblée treated unsuccessfully with X Rays and Salvarsan. —Dr. BULKLEY considered important indications could be obtained from the urine in skin cases.—Subcutaneous Calcinosis was described by Dr. F. PARKES WEBER (London), and Dr. NICHOLAS and Dr. MONTOT (Lyons) discussed a Congenital and Familial Chronic Bullous and Vegetating Dermatosis.

Before each meeting a large number of rare cases were exhibited.

SECTIONS XIII. AND XIX.—JOINT SESSION OF THE SECTION OF DERMATOLOGY AND SYPHILIGRAPHY WITH THE SECTION OF FORENSIC MEDICINE.

SATURDAY, AUGUST 9TH.

Professor BLASCHKO (Berlin) opened a discussion on

Syphilis: Its Dangers to the Community and the Question of State Control.

He referred to the German Society for the Prevention of Venereal Diseases, founded in 1902. This society was now known all over Germany, and was consulted by the Government. Many laws had been passed at its instigation, and he thought some such system would be of great use in England. Referring to the regulation of prostitutes, this in his opinion had never been of the slightest use in diminishing disease, for the excellent reason that it missed the most important class of case, the young clandestines. Indeed, any attempt to exercise control by police supervision was unsatisfactory. A board of health should be constituted for this purpose, while a system of registration applicable to both sexes ought to be in force. Facilities for treatment should be brought within the reach of all, and this should only be made compulsory for youthful or weak-minded individuals, in whose case isolation might be practised if necessary.

Professor FINGER (Vienna) urged the importance of education in sexual matters, especially for youths. It was also most necessary to instruct patients suffering from venereal diseases as to the nature of their condition and its dangers to others. Midwives were not sufficiently conversant with the aspects of venereal disease, and they also should receive instruction. He recommended improvement in the dwellings of the poor, especially with regard to bedroom accommodation. No difficulties ought to be put in the way of patients receiving treatment, which should be made as easy as possible, and for this reason hospital hours for consultation might be arranged at the most suitable times.

In the paper communicated for him Major H. C. FRENCH, R.A.M.C., who was absent through illness, dealt mainly with the subject of State Control. He thought venereal disease must in time become notifiable on account of the heavy cost to the State, apart from all other considerations. The Cantonment Act in India had effected a yearly saving of £55,515 when reckoned at 1*s.* per diem for hospital diet, quite apart from other considerations. The annual number of invalids from India to England with syphilis had been reduced from 611 in 1897 to 18 in 1910. It was a common error to suppose that a man suffering from venereal disease was as dangerous as a woman. Indeed, the amount of disease conveyed by a woman was probably a hundred times as much as that conveyed by a man. Although a syphilitic woman was a more real source of danger, any method of dealing with the question could only be successful by the early isolation of men and women and the efficient inspection of both. In Malta an enormous reduction in the incidence of syphilis had been effected by a system of confidential medical notification and more effective segregation of diseased persons. Both this and the reduction in India had taken place before the introduction of salvarsan. The administrative system of control existing in the army could easily be adopted or improved to meet the special requirements of civil communities in England. In summarising the means at disposal, he advocated medical notification of disease, suppression of *souteneurs* and solicitation, protection of orphans and destitute children, and police measures. There should be more available beds in hospitals, where systematic instruction of students ought to be carried out.

In their report Professor GAUCHER and Professor GOUGEROT (Paris) urged that it was as necessary to combat syphilis as tuberculosis or alcohol. Syphilis attacked the community in many ways, and the innocent suffered frequently. They called especial attention to the dangers from forks, tumblers, &c., in restaurants, and recommended boiling of these articles as a precaution. The risk of disease from domestic servants was possible, but this could be avoided by obtaining a health certificate, especially in the case of wet-nurses. In the case of the discovery of syphilis in a domestic the medical attendant should maintain professional secrecy, but should warn the patient of the danger of harming others, recommending entrance into hospital. The regulation of prostitution in France and other countries could not be efficiently carried out. Most syphilologists were unfavourable to it, for the majority of "prostitutes" escaped registration, and it was only applicable to one sex. Where the prostitutes were free from all administrative and medical supervision—the system of "abolitionism"—the results were much better. They recommended education of young men and young women, organised treatment of syphilitic prostitutes, the suppression and prevention of prostitution by the recognition of paternity, the conferring on seduced virgins of the rights of married wives, and by pecuniary or penal punishment of the lover who abandons his mistress.

Dr. L. E. LEREDDE (Paris) drew attention to the fact that syphilis in its various manifestations was second as a cause of death in Paris. This estimate included syphilis of the nervous system, viscera, and vascular system.

Dr. PONTOPPIDAN (Copenhagen) said all police supervision should be given up. Every patient with syphilis must notify the medical man, who would keep him under control and inform the authorities only for statistical purposes. Gratuitous treatment should be available for all. This had proved very expensive in Denmark. He urged that the doctor should not be turned into a policeman, but should maintain the ordinary relationship to his patient. Although their results were too small for statistics, he thought under the new *régime* they were much the same as before. There were, he pointed out, twice as many beds available for venereal diseases in Copenhagen as in London.

Dr. CARLE (Lyons) agreed that police supervision should go. When compulsion was given up he found a greater number of patients came to his policlinic. A third meeting of the International Commission in Brussels was required.

Dr. DOUGLAS WHITE (London) also disapproved of the registration system; it failed to account for the young "clandestine." He advocated the protection of minors. Any scheme should take into account gonorrhœa, which was three or four times as prevalent as syphilis.

Mr. J. E. LANE (London) thought syphilis a much milder disease now than formerly, due to the advance in general hygiene. All patients ought to be able to obtain salvarsan.

Dr. HELEN WILSON (Sheffield) did not believe in compulsion, nor was confidential notification, in her opinion, of much real value.

Dr. DUBOIS HAVENITH (Brussels) reminded the hearers that the words syphilis and venereal diseases frightened

Ministers. Public agitation was required to get governments to act, and England alone had started a general discussion.

Dr. WOODS HUTCHINSON (New York) advised notification. Venereal disease he thought less common than was usually held, but this could only be settled by statistics. Prostitutes belonged to the feeble-minded class, for no normal woman would continue such an occupation. The fact had been brought to his notice that sometimes one woman would entertain ten or 15 men in a single night in the brothels of Chicago.

Mr. D. VINRACE (London) thought that medical men should not become policemen. Notification was a breach of trust.

Sir MALCOLM MORRIS, the President of Section XIII., then spoke. He said the question was an international one. In these days no nation lived to itself, and with the modern means of international communication those who traded in vice could transfer their operations from country to country. He hoped the appeal, in which he had taken a part, for a Royal Commission on Syphilis would not be fruitless. The public were ignorant of all the facts of the case, and of the grave consequences of the disease. The State forced notification of infectious diseases, took charge of the insane, inspected workshops and factories, but did not lift a finger to protect the nation from this devastating pestilence. They had to urge the governments to decree confidential notification where this was not already done, and see that no case of syphilis went without treatment.

The following resolution was then put and carried unanimously:—

That, sensible of the ravages wrought by syphilis in the health of the community, and deploring the inadequacy of existing facilities for the checking of its dissemination, the International Medical Congress calls upon the Governments of all the countries here represented: (1) to institute a system of confidential notification of the disease to a sanitary authority, where such notification does not already obtain, and (2) to make systematic provision for the diagnosis and treatment of all cases of syphilis not otherwise provided for.

SECTION XV.—RHINOLOGY AND LARYNGOLOGY.

THURSDAY, AUGUST 7TH.

President, Sir STCLAIR THOMSON (London).

The PRESIDENT, in opening, welcomed the delegates warmly in English, French, German, and Italian.

A discussion took place on

The Recent Endoscopic Methods as Applied to the Larynx, Trachea, Bronchi, Œsophagus and Stomach.

Professor G. KILLIAN (Berlin) referred to the rapid strides made by the suspension method of laryngoscopy, and lauded Yankauer's method of aspirating mucus from the pharynx. He referred to the cure, sometimes permanent, of asthma by an intrabronchial spray of adrenalin and cocaine. In the removal of foreign bodies by bronchoscopy, tracheotomy increased the mortality by initiating pneumonia, nevertheless it was sometimes necessary.

Professor CHEVALIER JACKSON (Pittsburg) had collected records on this subject from all parts of America. He emphasised the necessity for careful preparation, as for an operation. As regards the position of the patient, when endoscopy was being undertaken for a foreign body in the larynx the Trendelenburg position was imperative, lest by gravity the foreign body fell into the lower air-passages. He examined as low as the bronchi, even of young children, without any anæsthetic, general or local.

Professor O. CHIARI (Vienna) quoted instances of nails, pins, and other difficult foreign bodies removed. He had been pleased with results obtained by suspension laryngoscopy.

Dr. H. LEWISOHN (New York) described his new telescopic œsophagoscope. Two flaps anchored the proximal part to the post-cricoid region, and then the telescope was extended to the cardia.

Dr. W. FREUDENTHAL (New York) showed a useful epiglottis retractor.

Dr. J. LONDON (New York) exhibited a new œsophagoscope on the principle of the cystoscope, but with a tiny mirror reflecting a very large field.

Professor MOURET (Montpellier) advocated a position with the patient sitting on a chair facing its back, the trunk flexed on pelvis and the head slightly extended—the attitude of a cyclist ascending a steep hill.

Dr. G. WILLIAM HILL (London) envied Professor Jackson his ability to perform without any anæsthesia. He showed a new apparatus for intratracheal anæsthesia.

Dr. R. H. SKILLERN (Philadelphia), Dr. J. KUBO (Japan), Dr. BRADEN KYLE (Philadelphia), Dr. H. MARSCHIK (Vienna), Dr. H. F. MOSHER (Boston), Dr. A. LOGAN TURNER (Edinburgh), Mr. HERBERT TILLEY (London), and Mr. ERNEST B. WAGGETT (London) also took part in the discussion.

Professor KILLIAN and Professor CHEVALIER JACKSON replied.

Afternoon Session.

Dr. LEWISOHN, Dr. SKILLERN, Dr. HILL, and Dr. LONDON demonstrated the use of new forms of endoscopic apparatus.

Mr. T. JEFFERSON FAULDER (London) showed a unique case of rodent ulcer in which the larynx was clearly visible through the large cavity of the ulcer.

Dr. E. J. MOURE (Bordeaux) read a paper on What Becomes of Sinuses that have been Operated on? Whether for frontal or maxillary sinus, the speaker regarded external drainage (Ogston-Luc or Caldwell-Luc operations) as essential, and complete obliteration of the sinus the goal.

Of the speakers who followed, Sir ROBERT WOODS (Dublin), Dr. MARSCHIK (Vienna), Dr. LUC (Paris), Dr. TRETROP (Antwerp), and Dr. J. GUISEZ (Paris) agreed with Dr. Moure; whereas Mr. WAGGETT and Dr. JAMES DONELAN (London) held more conservative views.—Dr. KUBO described his own operation.—Mr. TILLEY and Dr. JACQUES (Nancy) preferred to adapt each operation to the individual case.

Dr. GUISEZ read a paper on Radium, describing its usefulness in fibrous œsophageal strictures and resulting diverticula; and, as a palliative, in œsophageal carcinoma.

Dr. HILL showed his radium apparatus.

Dr. E. BOTELLA (Madrid) read a paper on 54 Cases of Foreign Body in the Air-passages and Œsophagus. In the former, a clear voice with a short brassy cough was diagnostic. The greatest danger was septic pneumonia.

Dr. KUBO showed some curious foreign bodies, among others a Japanese denture with black enamel teeth.

Dr. T. J. HARRIS (New York) read a paper on the Use of Radium for Papillomata of the Larynx. One patient, a woman over 50 years of age, had had these growths removed biennially for 26 years. Radium cured her.

Dr. FREUDENTHAL endorsed this usefulness of radium.

Dr. H. ZWILLINGER (Budapest) read a paper demonstrating the direct lymphatic communication between the frontal sinus and the meninges.

Dr. SKILLERN read a paper on the Untoward Sequelæ of 20 Frontal Sinus Operations, including ptosis, fistula, hemicranial anæsthesia, and diplopia.

Dr. R. F. RIDPATH (Philadelphia) had observed Dr. Skillern's operations. There had been no case of necrosis of the bridge.

Dr. A. GYERGYAI (Kolozsvar) read a paper showing apparatus and photographs on the direct examination of the post-nasal space.

Dr. R. HOFFMANN (Dresden) read a paper, with lantern slides, showing the erectile tissue and nerve distribution of the inferior turbinates.

Dr. FRÜHWALD (Vienna) read a paper on Mucocele of the Septum. He said operation was quite feasible under cocaine and adrenalin.

SECTION XVII.—STOMATOLOGY.

WEDNESDAY, AUGUST 6TH.

President, Mr. MORTON A. SMALE (London).

The opening meeting took place on Wednesday afternoon at the Royal Dental Hospital. The PRESIDENT addressed a few words of welcome to the section, and the foreign delegates briefly replied.

Mr. F. J. BENNETT (London) read a paper embodying the conclusions arrived at by himself and Mr. J. G. TURNER (London) as the result of their examination of some 500 teeth obtained from ancient Egyptian skulls. They found that these Egyptian teeth contained cavities which, on careful examination and comparison with carious cavities in modern European teeth, could be shown to be due to ante-mortem caries. In the series of teeth examined caries was present in 16 per cent., a figure which compares very favourably with the condition obtaining in present-day European teeth.

In the discussion which followed it was suggested by more

than one speaker that the incidence of caries varied inversely as the amount of work done by the teeth. This was emphatically denied by Mr. TURNER in his reply. He felt convinced that the incidence of caries depended, not upon the work done in mastication, but upon the soft and sticky quality of the food, and upon that alone.

Dr. ZILZ (Hungary) showed an extensive series of lantern slides demonstrating the presence in carious dentine of the tubercle bacillus in a resting stage. Dr. Zilz had obtained an emulsion from carious dentine in which no true acid-fast tubercle bacilli had been found. This emulsion he had inoculated into the peritoneal cavity of a guinea-pig, and had been able to obtain subsequently from the peritoneal cavity a culture showing typical acid-fast tubercle bacilli.

Mr. KENNETH GOADBY (London) and Dr. MENDEL pointed out that the lantern slides shown were not convincing, and that it was essential that members should have an opportunity of examining the actual microscopical preparations. Mr. Goadby emphasised the far-reaching importance of the experiment upon the guinea-pig detailed in the paper. He had had no previous success in similar experiments himself, but proposed to repeat them later.

Mr. J. H. GIBBS (Edinburgh) described an extremely interesting case of Polyphyodontism in a child. Three definite sets of milk molars were present on the right side of the mandible. One complete set of deciduous teeth was fully erupted. Beneath the erupted deciduous molars on the right side, and separated from them by a thin plate of bone, were two deciduous molars, and distal to these a permanent molar. In front of the first deciduous molar was the canine geminated with the lateral. Below these, again, were two deciduous molars and a permanent molar, a horizontal plate of bone again intervening. The actual teeth were shown to the meeting. It had been unfortunately impossible to obtain a skiagram. Just below the erupted first deciduous molar was evidence of the formation of a premolar tooth. There were also evidences of a fifth set of teeth below the third set of deciduous molars.

In the interesting discussion evoked by this case it was suggested that a comparison should be sought in the sharks.

In answer to a question by Mr. A. S. UNDERWOOD as to the condition on the other side of the mandible, Mr. GIBBS said that no sign of any abnormality had been found on the left side. Owing to the subsequent death of the child from whooping-cough it was impossible to follow out the case further.

An able paper by Dr. HÖNCZ (Hungary) dealing with traumatic implantation of teeth was discussed with interest.

Mr. GOADBY described an investigation by himself and Mr. J. BARRETT (London) into the bacteriology of pulpitis. Freshly extracted teeth were used, in which no gangrene was present. The teeth were acutely painful at the time of extraction. In the carious dentine the usual organisms were found, with streptobacilli in larger numbers than usual. On examination the pulp, where covered by a thin layer of hard though discoloured dentine, showed no bacteria whatever. Out of 10 cases in which the pulp was exposed, 3 showed no bacteria. In the remaining 7 cases streptococcus brevis was found in company with various other organisms. No yeasts nor any organisms of the mesenteric group were found in any of the pulps examined, though these organisms are common in the overlying carious dentine.

Dr. MENDEL expressed the hope that Mr. Goadby would turn his attention to the B. tuberculosis as a possible organism to be found in these cases.

Mr. J. F. COLYER (London) said that tubercle bacilli had been demonstrated in non-exposed pulps.

Dr. LORGNIER (Calais) read an interesting paper upon the Use of X Rays as an Aid to Diagnosis in Stomatological and Orthodontic Cases, which evoked a good discussion.

THURSDAY, AUGUST 7TH.

At the morning meeting a discussion upon the subject of

Pyorrhœa Alveolaris

was opened by Dr. ZAMENSKY (Moscow) and Mr. E. B. DOWSETT (London).

Dr. ZAMENSKY emphasised the presence of a rarefactive osteitis or osteoporosis in all cases of pyorrhœa, no matter what the cause. Osteoporosis was a predisposing cause. The pyorrhœa was brought about by local conditions which favour sepsis, such as tartar, stagnation of food, and want of due care in cleansing the teeth. Dr. Zamensky then exhibited a number of slides showing the pathological features of the various types of rarefactive osteitis.

Mr. DOWSETT pointed out that the primary lesion was a marginal gingivitis, brought about by careless cleansing of the mouth and teeth. He said that there were two types of treatment which might be adopted, viz., radical and conservative. In his opinion conservative treatment was only admissible in slight cases where the pockets were quite shallow and no general symptoms were present. In severe cases, especially in the presence of general symptoms, radical treatment by extraction was essential to cure. He expressed little faith in vaccine treatment.

In the very profitable discussion which followed many members took part, and varied opinions were expressed. But on the whole the sense of the meeting seemed to favour the more radical treatment in all but the slightest cases. Vaccines received very little encouragement, and the majority of speakers, with the notable exception of Dr. RHEIN (New York), heartily disapproved of treatment by fixation.

Afternoon Session.

At the afternoon meeting Mr. A. S. UNDERWOOD (London) and Mr. A. W. WELLINGS (Birmingham) communicated a paper embodying a preliminary note on the results of some researches into the development and composition of enamel, in which they were assisted by Dr. LOVATT EVANS (London).

Dr. LOVATT EVANS detailed an analysis of human and elephant enamel in which Frankland's method was used. His results showed the presence of a small quantity of organic matter (about 1 per cent.). He was unable at present to state the nature of the organic matter, but hoped to do so on some future occasion.

Mr. UNDERWOOD described the effect of strong acid upon enamel. A thin section of human enamel had been subjected to the action of strong acetic acid for 26 hours, the specimen being examined under the microscope at frequent intervals during this period, and the acid renewed from time to time. At the end of 26 hours, the structure of the enamel was quite clearly seen under the microscope, showing that prolonged exposure to strong acid did not entirely destroy the structure, as would have been the case if it were entirely inorganic. Mr. Underwood pointed out that the stellate character of the cells in the region known as the stellate reticulum was not to be observed in sections not treated with alcohol or decalcifying agents, and suggested that this stellate appearance was entirely artificial.

Mr. WELLINGS explained his method of staining by intra-vitam subcutaneous injection of trypan blue in rodents. By this method the forming enamel was deeply stained, while the dentine, cementum, and bone were only faintly affected. He showed a series of slides illustrating the various points raised in the paper.

Dr. LORGNIER briefly described a case of fracture of the mandible in which a Kingsley's splint had been used, with excellent results.

Mr. F. COLEMAN (London) detailed certain salient points in the treatment of mandibular fracture. He advised a delay of two or three days before applying a splint in order to allow the inflammation to subside. He described a clamp splint which he had found of great service.

Mr. J. LEWIN PAYNE (London) described the cradle splint which he had used with excellent results in many cases.

Mr. W. H. DOLAMORE (London) described a very interesting case in which his opinion had been asked as to the age of a child found dead. A child, aged 5 years and 10 months, had been missing from home and subsequently a body had been found. From a purely medical standpoint there was no evidence to show whether the body was that of a child of 6 or of 12 years. By an examination of the teeth, of which skiagrams were taken, Mr. Dolamore was able to show conclusively that the age of the child could not have been far removed from 6 years.

Dr. TALBOT (Chicago) in an able paper described certain periods of extra stress occurring in intra-uterine life, in childhood and in old age.

FRIDAY, AUGUST 8TH.

At the morning session a discussion on

The Relation of Nasal Obstruction to Dental Disease.

was opened by Mr. J. G. TURNER (London) and Dr. JULES FERRIER (Paris).

Mr. TURNER said that those who believed that nasal

obstruction had considerable influence upon irregularities of teeth would admit without question that there must of necessity be a close relationship also between nasal obstruction, dental caries, and periodontal disease. Dental irregularity favoured stagnation of food, an important cause of caries. Similarly, mouth-breathing was frequently accompanied by marginal gingivitis, a condition whence either cervical caries or pyorrhœa might follow. Mr. Turner reviewed the various factors which had been suggested as possible causes of dental irregularity; he maintained that one factor stood out far beyond all others in frequency and importance—viz., mouth-breathing, resulting from nasal obstruction. In support of this contention he pointed out that there was a constant association of adenoids with jaw deformities; that orthodontic treatment failed if nasal obstruction were not relieved; and that after excision of adenoids in early life, a sudden resumption of growth was seen in that part of the maxilla still capable of growth. The theory also provided a satisfactory explanation of the clinical manifestations of dental irregularity.

Dr. FERRIER dwelt briefly upon the theory advanced by some writers that though the constant association of nasal obstruction with dental irregularity could not be denied, it was impossible to decide which was cause and which effect; or, indeed, whether there was not some more general cause upon which both these conditions depended. He did not support this theory, feeling convinced that jaw deformities occurred as a direct sequence of nasal obstruction. Dr. Ferrier described the various deformities of cranium, maxilla, and mandible which might arise as a result of mouth breathing.

The papers evoked a very valuable discussion, in which many members took part. The main criticism advanced by several speakers, including Dr. TALBOT (Chicago), Dr. RHEIN (New York), and Mr. P. S. SPOKES (London), was that in order to discover the true cause of these deformities of the jaws it was necessary to look far beyond such local causes as were grouped under the head of "nasal obstruction." The environment consequent upon modern civilisation and the absence of true natural selection were really the root of the evil.

In his reply Mr. TURNER expressed his agreement with this point, but felt that while modern environment was a thing impossible to deal with in a generation, the fact still remained that by taking radical measures to obtain full nasal respiration it was possible for orthodontists to cure individual cases of dental irregularity, which was at least an important step forward.

Afternoon Session.

At the afternoon session Dr. CRUET read a paper in which he discussed the various types of stomatitis, dealing chiefly with the ulcerative and mercurial varieties.—The discussion was carried on by Dr. CHOMPRET, Dr. LEBEDINSKY, Mr. KENNETH GOADBY, and others.

Mr. S. F. STEADMAN (London) detailed an investigation upon 143 cases of malignant disease to show the relationship of pyorrhœa alveolaris to this condition. An examination of the Registrar-General's reports showed that 63 per cent. of all cases of cancer occurred in the alimentary tract; omitting the sexual organs, the alimentary tract was affected in 86 per cent. The 143 cases under examination affected various parts of the alimentary tract, the air passages, and parts in the region of the mouth. No less than 118 of these patients suffered from advanced pyorrhœa, while none were wholly free from it. Among 415 persons over 35 years of age not suffering from malignant diseases, examined as controls, only 66 had advanced pyorrhœa, while 56 were entirely free. It had been shown that cancer of the sexual organs and other parts of the body very commonly followed chronic inflammation; and it seemed reasonable to suppose that such a chronic inflammation as would arise in the gastric mucous membrane as a result of pyorrhœa should pass on into malignant disease. Moreover, the figures cited strongly supported this contention.

Most speakers supported these conclusions, though Mr. A. T. PITTS (London) felt that further evidence was essential before a definite conclusion could be arrived at.

Dr. LEBEDINSKY (Paris) read a paper upon the Relationship of the Wisdom Tooth to Stomatitis, which was discussed with animation.

Mr. KENNETH GOADBY described certain inoculation experiments carried out by himself upon rabbits, demonstrating the connexion between arthritis deformans and oral sepsis. The actual rabbits were shown, together with skiagrams of the joints involved.

Mr. A. HOPEWELL-SMITH (London) read a paper dealing with the microscopical anatomy of gingivitis, and showed slides illustrating the same.

SECTION XVIII.—HYGIENE AND PREVENTIVE MEDICINE.

THURSDAY, AUGUST 7TH.

President, Dr. ARTHUR NEWSHOLME.

The first meeting of this section was opened with a few introductory remarks by the PRESIDENT, who proposed a resolution in favour of scientific experiments on animals, provided they were carried out by competent persons and under adequate supervision. This was seconded by Sir ARTHUR WHITELEGGE, and carried unanimously.

The chair was then taken by Sir A. WHITELEGGE, H.M. Chief Medical Inspector of Factories.

A discussion on

The Effects of Dust in Producing Diseases of the Lungs

was introduced by Dr. EDGAR L. COLLIS, Medical Inspector of Factories, in a very able paper, evidently based on much study and research. He classified dusts according to their origin, as animal, vegetable, or mineral, and pointed out that the least injurious dusts belonged to the first two groups—in fact, there was no certain evidence that the animal dusts caused any definite form of pneumoconiosis. Workers affected by vegetable dust were those employed in the flax, jute, and cotton industries, and they exhibited a distinct train of symptoms, the chief of which were a peculiar shortness of breath, spasmodic dyspnœa closely resembling asthma, barrel-shaped chest, and scanty and tenacious sputum. No marked excess of phthisis was found amongst these workers. With regard to mineral dust, he had come to the conclusion that the inhalation of mineral dusts which contained free crystalline silica was associated with an excess of phthisis, which excess bore a direct relation to the amount of the material present. All his investigations showed that it was the presence of silica which was the injurious constituent of the dust. This was confirmed by the high death-rate among flint knappers, in whose work the dust was composed of free crystalline silica unmixed with other constituents, and by the fact that, though stonemasons everywhere prepared stone for building purposes in the same way, yet their phthisis mortality was very different in different parts of the country, being high when sandstones, which contain silica, were worked, and low when limestones, not containing silica, were worked. The deaths from phthisis occurring among 70,300 males in four industrial groups—viz., Sheffield grinders, Staffordshire potters, Cornish tinminers, and sandstone masons—amounted to 754, which, after making allowance for the normal annual phthisis death-rate in an ordinary male population left over 600 deaths annually due to tuberculous silicosis in those groups. In conclusion, he suggested the theory that the differences in type of respiratory diseases occurring amongst those exposed to different dusts depended rather on chemical composition than on the shape of the dust particles.

Professor F. HEIM (Paris) insisted that it was necessary to establish a classification of occupations producing dust diseases, which should be based on the varieties of noxious characters of the suspected dusts. He distinguished two classes—viz., (1) active dusts, either poisonous, irritating, or infectious, and (2) inert dusts, which might be soft or hard. He suggested that radiology might be a help in diagnosing the nature and degree of the disease.

Professor CAROZZI (Milan) pointed out that workers whose organs offered lessened resistance due to narrowness of the nasal passages, &c., were most susceptible to the action of dusts. Medical men in Sicily had noticed that workers in the sulphur mines, however seriously affected with pneumocosiosis and chronic lesions of the bronchi, hardly ever suffered from pulmonary tuberculosis.

Dr. R. MURRAY LESLIE (London) pointed out that one of the characteristics of miners' phthisis in South Africa was its dryness and absence of expectoration, and believed that it was owing to the same characteristic of dryness that cases

due to dust were so little infective. He thought the sharpness of the silica particles had much to do with their mischievous influence. In his opinion, the root of the lung was the first part to be attecked in the large majority of cases, and he drew attention to the great importance of radiography in the diagnosis of the disease.

Dr. ANGUS G. MACDONALD (Kingston, Jamaica) said that coalminers were not peculiarly liable to phthisis, though they suffered a good deal from pneumonia, which might, however, be due to other causes than inhalation of dust. In Jamaica pulmonary disease was very rare, and yet the streets were constantly enveloped in clouds of dust owing to the soft limestone with which the roads were metalled.

Dr. M. PRICE (Niagara Falls, U.S.A.) said that he had had the opportunity of examining workers in graphite, calcium carbide, and carborundum, who worked in clouds of dust, and stated that the mortality in Niagara Falls stood at a higher rate than that in any other part of the State.

Dr. S. BARWISE (medical officer of health of Derbyshire) said that the phthisis mortality amongst workers in gritstone was much greater than among those working in limestone or coal mines.

Dr. LESLIE MACKENZIE also spoke, and the CHAIRMAN paid a high tribute to Dr. Collis's work, and said he only regretted that time had not permitted them to enter into the question of the prevention of dust, on which much work had been done.

The members present adjourned to the Pathological Museum, when Dr. COLLIS lucidly explained a large series of specimens and photographs, &c., illustrating the subject.

Afternoon Session.

The chair was occupied by Dr. A. K. CHALMERS (medical officer of health of Glasgow).

Dr. K. H. BEALL (Texas, U.S.A.) read a paper on Pellagra in America, in which he pointed out that there were now 50,000 cases of the disease in the United States, with a mortality of over 25 per cent. He laid stress upon the remarkable incidence of the disease among women in America, which, however, did not obtain when statistics were taken from both sexes when living under the same conditions—e.g., in public institutions. In his view this might be explained by some condition peculiar to the home, but still undefined. It was also remarkable that in America one-third of the cases were city cases, and that, contrary to expectation, the black races were almost immune. In Texas, at any rate, he had not found the disease to be causally connected with the simulium fly, as believed by Dr. Sambon.

Other papers read were one by Dr. BERNHARD VAS (Budapest) on Researches into the Disinfecting Power of Some of the Commoner Disinfectants; one by Dr. ZIPPELL (Dijon) on the Disinfection Station of the City of Dijon; and a paper on Lead-poisoning among Workers in Printing Types by Dr. DEZSÖ HAHN (Budapest).

SECTION XIX.—FORENSIC MEDICINE.

WEDNESDAY, AUGUST 6TH.

President, Professor HARVEY LITTLEJOHN (Edinburgh).

In welcoming the members of the section the PRESIDENT remarked that when the last International Medical Congress was held in London, the subjects of Public Health and Forensic Medicine were combined under the title "State Medicine." Public Health had now developed into a science by itself, while Forensic Medicine had also made great advances, and its importance as a special branch of medical science, intimately associated with the public welfare and the administration of justice, had been generally recognised in all civilised countries.

The first paper was read by Dr. MAX SCHÄCHTER (Budapest), the subject being

The Royal Hungarian Medico-Legal Senate,

the Senate, consisting of the president, the vice-president, and 20 members, representing all branches of medical science. The questions submitted to the Senate by the law courts for arbitration are reported on by the various members of the Senate delegated for that purpose. After the points have been discussed the report is considered as expressing also the opinion of the Senate, if approved of by the majority. If the details supplied by the law courts are not sufficient for the Senate to come to a definite conclusion, if possible further particulars are furnished, and the persons directly concerned may be examined directly.

Conditions Simulating Drunkenness.

Dr. F. J. SMITH (London) read an interesting communication on this subject. He pointed out that the problem of whether an unconscious person was merely drunk or was very seriously or dangerously ill occurred almost daily in the routine of hospital work. He gave a list of those agencies which might produce unconsciousness, including certain diseases, injuries and poisons, but stated that it was not his intention to dwell upon this aspect of drunkenness, but he wished to draw renewed attention to another aspect of the matter, which, from a recent experience in court, he was afraid was not so commonly recognised or appreciated as it ought to be—namely, that what he termed the actively conscious stage of inebriety, hilarity, wildness of speech, and absurdity of conduct, might equally well be associated with or mistaken for, or rather not to be recognised as, serious and even fatal brain trouble. He quoted a case in point, in which a surgeon had stated in court that a meningeal hæmorrhage was necessarily associated at its onset with a stage of unconsciousness. Such evidence could only be the product of ignorance and want of experience, though unhappily it had won an unjust verdict in the case in question. After stating the evidence of science on the subject, he showed how this fully explained what to coroners and police officials was of everyday experience. Alcohol, at any rate in its earlier stages, acted as a stimulant to mind and memory and all the higher cerebral processes. Consciousness was not localised, but was a function spread over a large area of the cerebral cortex, and though increased cerebral pressure was one of the most important factors known to be capable of abolishing it, such pressure did not, and could not, arise at the first onset of a meningeal hæmorrhage, though he admitted that violent shock could produce it and be associated with the hæmorrhage.

THURSDAY, AUGUST 7TH.

An interesting discussion took place in the morning session on

The Medico-Legal Aspects of Infant Mortality.

Professor Etienne Martin and Professor Georges Mouriquand (Lyons) were to have read a paper on Sudden Death in Infants, but were unable to be present. The discussion was therefore opened by Professor F. STRASSMANN (Berlin), who read a communication on the subject of the discussion. He remarked that there were two specific modes of death in young children which occupied the attention of the medical jurist—smothering by negligence (overlying) and wilful starvation. They could only be diagnosed in the absence of other causes. He considered such cases to be rare, and as a rule in suspected cases death was shown to be due to natural causes. In his opinion the rôle of the thymus gland was still doubtful. He could not deny the possibility of a fatal compression by an enlarged thymus, nor yet the existence of a "status thymicus," but in actual practice he thought they were both rare. As a rule, in cases where a large thymus was present, bronchitis or enteritis, or both these conditions together, were found. He gave the results of 240 necropsies which he had made on the bodies of children in the first two years of life who had died suddenly without obvious cause. In 17 cases bronchitis was found, in 43 bronchitis with commencing pneumonia, in 7 intestinal catarrh, in 5 catarrh of the stomach and intestines, in 1 bronchitis and gastric catarrh, in 78 bronchitis and intestinal catarrh, and in 48 bronchitis and catarrh of the stomach and intestines. In addition, there were numerous instances of broncho-pneumonia combined with catarrh of the stomach and intestines or both. In 16 of the cases rickets was a prominent condition. In only one instance was there marked enlargement of the thymus. Great wasting was not a common condition. By itself it did not warrant a diagnosis of insufficient nourishment; in the rare cases in which this could be determined, it was usually proved by the evidence of witnesses, and only confirmed by the anatomical appearances. He suggested that improper feeding of infants, after careful instruction had been given, should be a criminal act if death should occur, but in view of the divergent views on the methods of feeding children only very gross errors would come within the law.

Sir WILLIAM J. COLLINS (London) said that legislation

and administration had been beneficially active in regard to infant mortality, but from the point of view of forensic medicine it had been much neglected. The whole question of death certificates and coroners' law in England required radical revision. There was no certificate required for the stillborn, and it was open to doubt whether some of those dealt with were in fact stillborn. Moreover, the law did not require certificate of the fact of death as apart from the alleged cause. In some cases, those certified as dead had been found in the land of the living and many were buried without any death certificate.

Professor J. GLAISTER (Glasgow) said that in cases of death from asphyxia it was often most difficult to determine the actual cause of that condition. The discovery of actual disease will of course be decisive; but in instances of laryngeal spasm or of overlying there may be no indications of how death was brought about. Some of the most difficult cases of death in children to investigate were those in which there was marked malnutrition. Sometimes syphilitic disease of the liver was found, and if ill-treatment was alleged the question became very complicated. Convulsions were caused by many conditions, but the post-mortem signs would be only those of asphyxia. He strongly urged that the laws of death-certification should be amended.

Professor D. D. MACTAGGART (Canada) also commented on the difficulty of determining the cause of death when signs of asphyxia were present.

Dr. C. TEMPLEMAN (Dundee) also maintained that many bodies of children said to have been stillborn had really been born alive and no inquiry was made as to the true cause of death.

The PRESIDENT, in discussing the question of enlargement of the thymus gland and the status lymphaticus, said that he had never been able to satisfy himself that the thymus compressed the trachea to such an extent as to cause death, but he considered that it might press on the heart or surrounding structures. He was of opinion that in some cases of unexpected sudden death in children the only explanation was the condition of status lymphaticus, especially when associated with chloroform anæsthesia or in certain forms of violence.

In the afternoon session Dr. DAVID NICOLSON, C.B. (London), contributed a note on

Criminal Lunacy.

He maintained that the heredity of crime on which so much had been founded was a mythical and dangerous doctrine advanced by so-called criminologists, who apparently looked upon criminals as poor hapless creatures foredoomed by nature from birth to eventuate as parasites living upon society by the perpetration of punishable acts.

Dr. O. F. N. TREADWELL (medical officer, H.M. Prison, Parkhurst) read a paper on

Conduct in Feeble-minded Criminals.

He confined his remarks mainly to some forms of disorder of conduct observed in them while under custody in institutions and when subjected to institutional discipline. He explained that the term "feeble-minded" or "weak-minded" was used in prison parlance to denote all kinds of mental disorder which appear to indicate lessened responsibility. It was sufficiently comprehensive to include several classes, in all of which there was to be observed mental defect, ranging from a slight degree of divergence from a standard called by the observer the normal, to conditions of mental alienation just short of certifiable insanity. There were some criminals whose record of crimes and of misconduct in prison could hardly be exceeded, but in whom no other evidence of mental defect could be observed, who were nevertheless alert and intelligent and without prominent stigmata of physical degeneration, and who could not be looked upon as other than merely vicious. A careful examination, however, into the intellectual capacity of these badly conducted prisoners usually revealed some co-existent defects on the intellectual side, indicative of a low level of intelligence and often accompanied by some of the characteristics of physical degeneration. It was the presence of several of these in the same individual that was important in determining the classification of feebleness of mind on the difficult border-line. These border-line cases often gave much trouble in the management of prisons and institutions in which they were incarcerated, in consequence of the disorder of conduct to which they were prone. Their physical conformation was quite up to the average, their conduct was bad, but the evidence of defect of intelligence was meagre, and it was impossible to be sure that such cases were not simply those of depravity. Each case could only be decided upon its merits in accordance with the experience and judgment of the observer. The grosser cases were much less common than they used to be, and improvement had occurred *pari passu* with the lessened rigour of prison discipline. Conduct of feeble-minded prisoners greatly improved under modified regulations and specially selected attendants. He urged the importance of the segregation of feeble-minded criminals of the badly-conducted class.

Dr. ANGELO DE-DOMINICIS (Milan) communicated two papers, one on the Diascopy of Blood Traces, and the other on Some Experiments in Revivication.

FRIDAY, AUGUST 8TH.

Professor L. THOINOT (Paris) opened in the morning session a discussion on

The Teaching of Forensic Medicine, including the Construction and Equipment of a Medico-Legal Institute.

He considered the subject under three headings: 1. To whom should forensic medicine be taught? 2. How should it be taught? 3. How should a medico-legal institute be constituted? He said that every student of medicine should receive elementary instruction in forensic medicine, for every practitioner should be capable of assisting the requirements of justice, such as an examination of a person who has been wounded, or the performance of a post-mortem examination for medico-legal purposes. But in addition to this elementary course there should be a senior course, made as perfect as possible, for those medical men who intend to make a special study of the subject. If the instruction cannot be suitably given at the smaller schools it should be carried out at all the University centres. Professor Thoinot proceeded to give a syllabus of the subjects which should form a basis of the lectures and on which students should be expected to show a competent knowledge in the subsequent examinations. The subjects he mentioned were similar to those selected for the examination on forensic medicine at the London and other universities in this country. In addition, he insisted that opportunities should be found for giving practical instruction in post-mortem and laboratory work. He maintained that the teaching of forensic medicine should be carried out in a medico-legal institute, which should possess a complete autonomy. Such an institute should consist of two parts: (1) A mortuary with the necessary laboratories attached, and (2) suitable arrangements for teaching. The building should contain every requirement which is necessary for medico-legal investigations, such as post-mortem room, lecture theatres, library, museum, and chemical and bacteriological laboratories. He referred to the medico-legal institutes in Bucharest, Budapest, Breslau, and Zürich as good examples of supplying all that is necessary for instruction and investigation.

Professor H. ZANGGER (Zürich) continued the discussion, and dwelt more particularly on the development of medico-legal knowledge. He said that the task of an institute of legal medicine and education consisted in carrying out in theory and in practice the claims that the Legislature make on medicine. This constituted the quantitative and qualitative examination of facts whenever any circumstances likely to have legal consequences have been brought to bear on the human body. These "circumstances" might lead to investigation in the criminal or civil courts, or under "contract law," or in connexion with "insurance." It was necessary that students should be taught to follow up each individual case, and the responsibility which involves on the examiner in such cases "right up to the consequences of the verdict" should be duly explained to him. He maintained that the most important point was the "reconstruction" of the chief circumstances of the case from the time that the incident under investigation arose.

In the subsequent discussion, in which Sir W. J. COLLINS, Professor GLAISTER, Dr. F. J. SMITH, Professor PUPPE (Königsberg), Professor SCHÄCHTER (Budapest), and others took part, the principle of a medico-legal institute for instruction and investigation was strongly approved. The

centralisation of the teaching and the appointment of a lecturer who had had special experience were also insisted on. From the remarks of some of the speakers it was evident that in some countries the opportunities given to the student for studying forensic medicine left much to be desired.

The following resolutions were adopted:—

That an obligatory instruction for medical students and law students, divided separately for both if necessary, followed by an examination as far as medical students are concerned, should be instituted.

That a special practical instruction be instituted in forensic medicine for those who desire to become a specialist in dealing with forensic medicine.

The instruction must be accompanied by the provision of material of the living and dead.

Dr. A. J. HALL (Sheffield) read in the afternoon session a paper on

Diachylon as an Abortifacient.

He desired to call the attention of the section to a practice which had been steadily growing and spreading in England—viz., the taking of diachylon for the purpose of procuring abortion. He outlined briefly the history of our knowledge of the effects of lead in poisonous doses upon the fœtus, and referred to the original observations of Constantine Paul in 1860. The practice appeared to have begun in the Midlands about the "nineties," and the probable source of the knowledge was the prevalence of plumbism amongst industrial female workers in lead in that district. The gradual extension of the practice, as evidenced from recorded cases, was outlined, from the cases at Leicester in 1893 to the outbreaks at Nottingham, Birmingham, and Derby about 1898, and that in and around Sheffield from 1901 to 1906. Up to that date the practice was limited, except for one or two isolated cases, to the Midlands, as was ascertained by an inquiry made by Ransom and the author at that time. This inquiry was made on behalf of the British Medical Association, who attempted at that date to get diachylon placed on the poison schedule. This attempt failed. A further inquiry made specially for the purpose of this paper showed that the practice had now spread widely to the most distant parts of the country. Cases had been observed in Leeds, Manchester, London, Bristol, Hull, Newcastle-on-Tyne, Glasgow, Aberdeen, and Cardiff. No cases had occurred in Ireland. The greatest severity of the evil was during the final years of the last and the early years of this century, when trade depression was very severe. During the last few years the cases were less numerous, even in the Midlands, but they still occurred in considerable numbers, and the fact that the practice had extended to many fresh centres of population made it probable that with a return of bad trade the practice would assume grave proportions again unless steps were taken to repress it. In no other countries, excepting a few cases in Germany, did this practice seem to have existed. It was largely adopted by women anxious not to increase the size of their families for economic reasons, and they were quite unaware of the terrible dangers to life and health involved. If diachylon were scheduled as a poison to-morrow, or its sale absolutely prohibited, it would be no loss to medicine, as it was therapeutically unnecessary, and there was no doubt the practice would be largely if not entirely stopped.

Amongst other communications was one by Professor F. STRASSMANN (Berlin) on New Observations on Injuries Produced by Motor Vehicles.

SECTION XX.—NAVAL AND MILITARY MEDICINE.

WEDNESDAY, AUGUST 6TH.

President, Surgeon-General Sir LAUNCELOT GUBBINS, K.C.B.

This section met in the Lecture Theatre of the Royal Army Medical College, Millbank. The PRESIDENT in his short introductory address alluded to the last International Congress that had met in London, when the antiseptic treatment of wounds was the chief subject for discussion, but no mention was made of asepsis. That meeting was distinguished by the presence of the great army surgeon, von Esmarch.

Colonel B. M. SKINNER, A.M.S., Commandant of the College, read a paper contributed by Surgeon-General A. T. SLOGGETT, A.M.S., Director of Medical Services in India, on

The Transport of Wounded in Hill Warfare.

Various patterns of conveyance were described, it being mentioned that, strictly speaking, a *dhooly* is a conveyance in which the bed is suspended from the pole, and a *dandy* one in which the bed is supported by two poles, one fixed into either end. The present pattern is really a *dhooly*, but is officially called a *dandy*. The experience of various campaigns was referred to, dating back from the prolonged war in Afghanistan (1878–80), when many types of this native conveyance were in use, through the Chin-Lushai expedition (1889–90) and the Tirah campaign (1897–98), to the two more recent operations in Tibet (1903–04) and the Abor country (1911–12). For serious cases the regulation *dandy* carried by four men, with two in reserve, has several advantages—e.g., steadiness, protection from sun and rain, and the fact that it forms a very comfortable bed; *per contra*, it is heavy (92 lb. in weight), and from its length is unsuitable for hill paths with sharp turnings. The *kilta*, or basket chair, carried on the back of a hillman, as in Assam, is comfortable, and can be used over difficult country. Stretchers and hammocks have certain distinct disadvantages in a hilly region. Thoroughly seasoned bamboo is the strongest wood for its weight that can possibly be procured, and should invariably be used in the construction of *dhoolies* and extemporised stretchers. The Indian *kahar* is a man whose forebears have carried *dhoolies* for countless generations; he knows how to apply his strength to the best advantage, and adopts a peculiar gait which reduces shaking to a minimum. Summing up the whole requirements as to sick and wounded transport in hill warfare, it was stated that on the actual hillside lying down cases must be carried in stretchers; cases that can sit up in hammocks or sling carriers; slight cases to proceed on foot. For the mountain road, lying down cases require *dhoolies* or hammocks; sitting up cases can be conveyed in wooden *khajawahs*, with canvas sides and hood; and slight cases can ride on pack saddles. When wheeled transport is available, the ambulance tonga is suitable for all cases.

Major E. NIENHAUS, of the Swiss Army, showed some excellent photographs on the screen of wheeled stretchers and divided stretchers, applicable to steep gradients, and explained their use under special circumstances and over snow.

Colonel P. HEHIR, I.M.S., also spoke.

THURSDAY, AUGUST 7TH.

Surgeon-General A. W. MAY, R.N., who occupied the chair, welcomed the delegates and visitors to the discussion of a purely naval question—viz.:

Hospital Ships and Transport of the Wounded,

which was introduced by Surgeon-Inspector I. NISHI, of the Imperial Japanese Navy. The subject was considered under the two heads of the requirements in peace and in war. Any vessel allotted for the purpose should be an entirely new ship, and adequate preparation should be made during peace time for the requirements of war; obviously there would be financial difficulties to be overcome.

Fleet-Surgeon D. J. P. MCNABB, R.N., advised the use of a cargo boat of 6000 to 8000 tons, in the absence of any specially designed vessel; a ship of this size should accommodate 300 to 400 sick. In taking over such a vessel two points were to be borne in mind: (1) a cargo boat is designed to run full, and when used as a hospital ship would be less than half full—various strains might be set up, to be guarded against by judicious strengthening; and (2) lifts should be provided to move patients from deck to deck.

The second paper was by Dr. ZOLTAN VON AJKAY, of the Austro-Hungarian Army, on

Water-Supplies in the Field.

It was pointed out that a satisfactory solution of this important problem had not yet been found; neither the addition of chemicals nor filtration could give satisfactory results in all circumstances. The most recent suggestions, such as ozonisation or the use of the ultra-violet rays, presented great practical difficulties when actually tried in the field. On the other hand, a portable heat steriliser, such as the Hartmann pattern, did provide a sterile water. Of course, there were difficulties, but the boiling could be done.

Colonel W. H. HORROCKS, R.A.M.C., described a method

at present under trial at the Royal Army Medical College. Alum is used to precipitate turbid matter and bleaching powder as a chemical purifier, filtration, or straining, being effected through a thick cloth. The results were very satisfactory.

The experience of the French military authorities in Algeria had been favourable in regard to chemical methods of purification, according to Médecin-Inspecteur Dr. VAILLARD, as also has been that of the Italian army, as testified by Inspector-General CAVALLERLEONE.

In the laboratories of the Royal Army Medical College was displayed an extremely interesting exhibition of appliances for water purification, including various forms of filters, sterilisation by heat and by chemical methods, and by the ultra-violet rays.

Dr. GEORG MAYER (Munich) spoke at the afternoon session on

Epidemics caused by Different Articles of Food.

The outbreaks might result from chemical poisons of either organic or inorganic origin, from bacteria and their toxins, or from trichinæ. A *résumé* of the various kinds of food by which poisonous effects might be produced was given. The remedial action proposed was twofold: (1) by means of inspection and regulation on the part of the police; and (2) by means of instruction of the producer and consumer. Among the regulations recommended to be enforced especial stress was laid on the need for extreme cleanliness in every detail connected with the preparation and sale of food articles. With regard to large undertakings, such as the military commissariat department, hospitals, boarding-houses, hotels, and prisons, these establishments should conclude contracts in accordance with the administrative regulations recommended.

In the discussion which followed Lieutenant-Colonel W. W. O. BEVERIDGE, R.A.M.C., referred to the results of experiments in cooking. The temperature reached in the interior of the articles rarely rose as high as would be expected. He also alluded to the danger of keeping food that had been cut up overnight and consumed in the morning after exposure to contamination, outbreaks of food poisoning in soldiers having occurred from this cause.

Dr. G. MAYER also contributed a paper on Formaldehyde Disinfection.

SECTION XXI.—TROPICAL MEDICINE AND HYGIENE.

THURSDAY, AUGUST 7TH.

President, Surgeon-General Sir DAVID BRUCE, C.B., F.R.S.

The PRESIDENT, in opening the proceedings, offered a cordial welcome to the representatives of the profession from the various countries. He remarked that at the last meeting of the Congress in London in 1881 there was no section dealing with tropical medicine, but since then that subject had attained very great prominence and importance, and its literature at the present time might be described as colossal. This was an age of specialists, but in tropical medicine it was found that even a small corner of a special subject was more than enough for the average man to master thoroughly. In looking back at the workers of the past generation it was surprising to find how near the truth their surmises were in respect of many diseases—yellow fever for instance. In glancing at the progress of this branch of medicine it was apparent that the tropics were the haunts of protozoa and insects, while in the temperate regions bacterial diseases were more common. Before calling on the readers of the papers the President announced that a small committee had been formed to consider the nomenclature of Malta fever, and that it would meet during the week. A resolution was then passed, similar to that laid before the other sections, in favour of experiments on animals by competent persons in the interests not only of man but also of animals.

Plague.

A discussion on this subject was opened by the reading of a paper by Dr. A. G. BAGSHAWE, the secretary, in the absence of the author, Professor S. KITASATO (Japan), on the Value of the Search for Rat Fleas in the Detection of Plague, illustrated with lantern views, and in this was emphasised the importance of using guinea-pigs in the discovery of the germ. (An abstract of this paper appeared in THE LANCET of August 2nd.)

Major W. GLEN LISTON, C.I.E., I.M.S., contributed two papers, the first dealing with the contrast of the epidemiological features of bubonic and pneumonic plague, and the second considering the immunity of Mus rattus to plague infection. In these papers a number of experiments performed by the Plague Commission in India were described and the results given. (An abstract of Major Liston's paper was given in THE LANCET of August 2nd.)

Dr. C. J. MARTIN, F.R.S., and Mr. A. W. BACOT (of the Lister Institute) furnished a very interesting demonstration, with the help of numerous lantern slides, giving the results of some observations which they had made upon the mechanism of transmission of plague by fleas. It was shown by the experiments that infection could occur during the act of blood-sucking by the flea, and in such instances it was found that the pro-ventriculus of the flea was blocked by masses of cultures of B. pestis. It was not denied that infection might occur in other ways, as, for example, by the fæces of the flea dropped upon the skin of the victim at the time of biting and rubbed into the bite by the hand.

Dr. WU LIEN TEH (Dr. Gnoh Lean Tuck of China) described his investigations into the relationship of tarbagan to plague, which will appear in a future issue of THE LANCET.

Dr. R. ROW (Bombay) read a paper on the use of an anti-plague glycerinated vaccine, prepared in a special way, which he described, and containing no antiseptic. It was, in Dr. Row's opinion, better adapted for using in graduated doses, since there was no clump formation in it.

Dr. VAN LOGHEM (Amsterdam) gave the results of certain experiences of plague in Java and as to the use of two antiplague vaccines, one obtained from Bombay and the other of German manufacture.

Mr. J. CANTLIE (London) alluded to some anomalies of plague incidence in Bombay and Hong-Kong; in the former it was a winter disease and in the latter it occurred chiefly in summer.

Dr. AGRAMONTE (Habana) gave some interesting particulars of the recent outbreak of plague in Cuba.

Dr. G. DUNCAN WHYTE (China) spoke of his experience of plague in China.

After Major LISTON and Dr. MARTIN had replied, the PRESIDENT closed the discussion, making some reference to the occurrence of plague in South Africa in 1900, when he was there. He regarded the papers which had been read before the section as being of great value as well as of special interest to the members.

At the conclusion of the morning sitting Dr. WU LIEN TEH gave a microscopical demonstration of plague material in connexion with his investigations on the tarbagan.

Afternoon Session.

At the afternoon sitting Professor G. H. F. NUTTALL (Cambridge) presided, and Dr. VAN LOGHEM read a paper dealing with the difference between the cholera vibrio and the vibrio discovered at El Tor. The author dissented from the view held by many bacteriologists that the El Tor vibrio was a real cholera vibrio, and tried to prove this by a number of facts. He demonstrated certain differences between the organisms with the help of a series of autochromatic photograms (Lumière).

Dr. DA ROCHA LIMA (Hamburg) then read a paper in German, illustrated by many lantern slides, on Pathologisch-anatomische Beobachtungen bei einigen Tropenkrankheiten.

Dr. J. TCHUDNOWSKY (Paris) contributed a paper in French on Acclimatement dans les Pays Tropicaux, which was discussed by Dr. VAN LOGHEM.

Dr. H. EVERS (Angaur) read a contribution in German on Therapie von Dysenterie mit Chinosol.

Dr. AGRAMONTE offered some observations on the So-called Yellow Fever Parasite discovered by Dr. H. Seidelin, and, referring to the part he had taken in the investigation of the etiology of the disease, declined to admit the specificity of the bodies shown by Seidelin.

Dr. DUNCAN WHYTE read an article upon an Undescribed Form of Ulcer met with among the poorer classes in some parts of China.

A paper was down upon the programme by Captain R. A. Chambers, I.M.S., on Enteric Fever in Indians, with special reference to its occurrence in the Indian Army, but in his absence printed copies of the paper were distributed to the members of the section, and it was not read.

FRIDAY, AUGUST 8TH.

Before the items on the programme were begun, the PRESIDENT announced that on the previous day the committee appointed to consider the nomenclature of Malta fever had met, and after discussing a number of suggestions as to altering the name, and having considered the terms put forward, such at goats' milk fever, goats' fever, septicæmia Brucei, morbus Brucei, &c., had decided to recommend that henceforth the disease should be known as *undulant fever*. It was proposed, therefore, by the PRESIDENT, and seconded by Mr. CANTLIE, that the decision of the committee should be accepted, and this was carried unanimously.

Discussion on Beri-beri.

A very important discussion was then opened on beri-beri, and the section was fortunate in having present at the meeting some of the best known of those who have done admirable work in the investigation of the etiology of the disease.

The discussion was opened by a paper read (in German) by Professor C. EIJKMANN (Utrecht) on the Aetiologie und Prophylaxis der Beri-beri, illustrated by diagrams. In concluding his paper the author pointed out that from the standpoint of the new partial-hunger or deficiency theory, it had to be remembered that the need of the body for vitamine varied somewhat in the individual, sex, mode of life, occupation, race, place of residence, climate, and season of the year.

Professor B. NOCHT (Hamburg) read a paper on the same subject.

Dr. L. BRADDON (Federated Malay States), who has been a pioneer in this work, spoke on some of the results of the measures taken against beri-beri in British Malaya, showing conclusively by tables and diagrams that the stoppage of the use of white (overmilled) rice in hospitals, prisons, and asylums was followed almost at once by the disappearance of the malady. He proposed at the conclusion of his address a series of resolutions which before being considered by the section were referred by the President to a small committee consisting of Dr. J. C. Martin, Dr. Braddon, and Professor Nocht, to be amended and redrafted.

Dr. C. FUNK (Lister Institute, London) read a short paper concerning the neuritis-preventing substance "vitamine," contained in the subpericarpal layers of the rice grain. He regarded the vitamin as a complex substance, and one which was easily split up. His researches on this matter, however, are not yet completed.

Dr. H. SCHAUMANN (Hamburg) also read a paper on the subject.

Dr. S. SHIBAYAMA (Tokio) sent a contribution on the present state of the study of beri-beri in Japan.

Among those who took part in the discussion were Professor FILLIPO RHO (Director-General of the Medical Department Italian Navy, Rome), who spoke in French; Dr. SHIMAZONO (Japan), who spoke in German; Dr. L. NATTAN-LARRIER (Paris), Dr. MALCOM WATSON (British Malaya), Dr. TSCHUDNOWSKY (Paris), Dr. L. G. FINK (Burma), Dr. D. E. ANDERSON (London), Dr. AGRAMONTE, Dr. L. SAMBON (London), Miss MAY YATES (secretary to the Bread Reform League), Mr. CANTLIE, Dr. DE FREITAS CRISSIUMA (Brazil), Dr. L. G. CHACIN-YTRIAGO (Venezuela), Dr. C. NOEL DAVIS (Municipal Medical Department, Shanghai), and Sir PATRICK MANSON (London).

The readers of the papers having replied, the resolutions on beri-beri as amended were then proposed by Dr. MARTIN and seconded by Professor NOCHT and carried by a large majority. They were as follows:—

1. In the opinion of this section beri-beri among natives, whose staple food is rice, is induced by the continued and too exclusive consumption of the grain in its highly milled form, by which treatment the cortical and subcortical layers are removed.
2. The section urges upon all authorities responsible for the health of native communities the encouragement, by every means in their power, of the restriction of the use of rice of this kind.
3. In view of the proved non-infectiousness of beri-beri, the section suggests to all port authorities the propriety of abolishing quarantine and the restrictive measures at present in operation.

Afternoon Session.

At the afternoon sitting, which was presided over by Colonel Sir WILLIAM LEISHMAN, F.R.S., the programme included two papers which, in the absence of their authors, were taken as read. The first, by Colonel P. HEHIR, I.M.S. (Assistant Director of Medical Services, Burma Division), described a condition associated with ulcerated and swollen gums among Indian troops, of which he had seen during the last six years over 2000 cases, and which he suggested might be due to defective dietary. The second paper was by Dr. STEWART (Michigan) on the Probable Identity of Pellagra and Sprue.

Professor CLEMENTINO FUAGA (Brazil) read a short paper on Le Foie dans le Paludisme Chronique, Diagnostic, Physique et Fonctionel.

Dr. D. E. ANDERSON (London) contributed some Notes on Verruga Peruana, a disease of obscure origin met with in some districts of Peru.—This paper was discussed by Professor E. A. MINCHIN (London) and Sir WILLIAM LEISHMAN.

Professor KATSURADA (Japan) read a paper (in German) on Schistosomiasis, and showed a number of specimens of this form of parasite.—A short discussion followed, in which Dr. SAMBON and Sir WILLIAM LEISHMAN took part.

SECTION XXII.—RADIOLOGY.

WEDNESDAY, AUGUST 6TH.

President, Sir JAMES MACKENZIE DAVIDSON (London).

After a short introductory address by the PRESIDENT, who briefly reviewed the great progress of radiology since the discovery by Professor Roentgen, a paper entitled

Les Rayons de Roentgen dans Traitement des Leucémies,

by Dr. BÉCLÈRE and Dr. HENRI BÉCLERE was read by the latter. After a detailed description of its pathology, various types, and complications, the authors claimed great amelioration in all cases practically without exception. In giving a history of cases treated, it was claimed that marked improvement could be noted in the blood by the end of the first or second month. The technique was on the usual lines now obtaining—massive doses, cross fire, and filtration, the tube to be at least medium hard. It was necessary to arrange the interval between the doses of adequate length to avoid toxæmia. The usual medicinal treatment should be concurrent.

Dr. J. T. CASE (Michigan) read a paper on

Roentgen Studies of Colon Peristalsis and Antiperistalsis, with Special Reference to the Function of the Ileo-cæcal Valve.

This was a most interesting paper and was illustrated with a series of excellent radiographs. Dr. Case sometimes spends as many as eight hours at a time studying patients in various stages of bismuth meals. Consequently he has been enabled to make observations of phenomena not usually seen by the average radiologist. He has been rewarded by seeing on nearly 40 occasions the remarkable mass movement of the colon that seems to be a normal procedure, but which, as it takes place only at long intervals and is all over in a second or two, is seldom seen. It is an action that seems to be stimulated by the ingestion of food into the stomach. The evacuation of the colon and rectum of infants immediately after feeding is a familiar instance. An interesting point was brought out regarding the ileo-cæcal valve. Cases that are frequently described as ileal kinks Dr. Case has shown to be no more than an overloading of the distal end of the ileum through incompetency of this valve. The point is not without its importance in view of some recent writings.

Dr. BELOT (Paris) and Mr. CECIL R. C. LYSTER (London) both read papers on the

Treatment of Exophthalmic Goitre by the X Rays.

Dr. Belot claimed that the X ray method was unquestionably the best and least dangerous form of treatment for the complex group of symptoms comprised in the term "maladie de Basedow." The ordinary medical treatment was not interfered with. The technique is briefly as follows:—The gland is marked out in pencil and divided into two lateral areas and a median area. To each area a dose of 4 to 5 H is administered through an aluminium filter 1–2 mm. in thickness, the surrounding areas being covered with lead. A hard tube 7–9 Benoist is used. Several days' interval must be allowed or absorption symptoms intervene. It is necessary to remember that the skin of the neck is peculiarly sensitive to the rays. If this treatment cannot be regarded as specific it at least yields results superior to any other treatment and should be always tried. It should always be associated with

medicinal and hygienic measures, and is specially valuable when allied to electrotherapeutic measures.

THURSDAY, AUGUST 7TH.

The morning was given up to a consideration of

Radiography as Applied to the Investigation of the Stomach and Intestines.

The session was unfortunate in the absence through ill-health of the authors of the two papers forming the basis of discussion. That of Dr. HOLZKNECHT (Vienna) was read in part by Dr. ALBAN KOHLER (Wiesbaden). Beginning with the stomach, the author pointed out that radiology appealed to the eye, and thus greatly enhanced the value of inspection in a region where percussion and auscultation had little to offer. The importance of radiology had not appeared in the discovery of new diseases, but rather in assigning the correct diagnosis to the individual case. The author's custom was to consider the patient's history *after* screening to determine the motility of the stomach; then only could the symptoms be seen in their true light, and it appeared that duodenal ulcer was the most frequent "stomach trouble." Stress was laid on Haudek's double-meal procedure and on the serious import of gastric anti-peristalsis. The author proceeded to review the technique of examining the intestine, giving the results of observations of bismuth meals and the signs of various affections and abnormalities of the intestinal tract.

The paper of Dr. C. LESTER LEONARD (Philadelphia) was read in part by Dr. PANCOAST (Philadelphia). This was a very extensive report, even though the writer confined himself to a review of the most salient features gathered from the available literature and his own experience. After referring to the conditions peculiar to the more or less normal stomach, including the motor functions, time of emptying, and so on, the author dealt with the various pathological conditions that had been observed and further elucidated by the method of examination. It would be impossible adequately to deal with this treatise here; even though the author had condensed it as far as possible it remained a voluminous document, and must be read *in toto* if its value is to be appreciated.

In the subsequent discussion Dr. A. C. JORDAN (London) emphasised the necessity for an examination in the recumbent as well as in the upright position in all cases, and further, in view of the interdependence of the whole of the digestive organs, a complete examination must include the progress of the opaque meal right through the digestive tract.

Dr. A. F. HERTZ (London), Dr. G. A. PIRIE (Dundee), Dr. A. H. PIRIE (Montreal), and others took part in the discussion.

Dr. G. E. PFAHLER (Philadelphia) read a paper on

The Treatment of Recurrent and Metastatic Carcinoma of the Breast by Means of the Roentgen Rays.

His method consisted essentially in the application of massive doses by the "cross-fire" method up to the limit of the toleration of the skin. Treatment should be begun immediately after the operation, or, better, a heavy dose should be given at the time of the operation and before the wound was closed. He was not in favour of ante-operative treatment as had been suggested. For a filter he uses a thick layer of leather on the skin, and close to the tube a layer of aluminium from 1 to 4 mm. thick, according to the depth it is desired to influence. Concurrently with this he gives his patients thyroid extract, and believes that his results are favourably influenced thereby.

Dr. LEWIS GREGORY COLE (New York) read a paper on

The Diagnosis of Post-pyloric (Duodenal) Ulcer by Means of Serial Radiography.

He said: The importance of recognising the presence of post-pyloric (duodenal) ulcer is evidenced by the communications of Moynihan, Codman, William Mayo, and Mayo Robson. For this purpose two radiographic methods have been employed hitherto by roentgenologists—Hemmeter, Holzknecht, Schwartz, Ashbury, Haudek, Strauss, Kreuzfuchs, and Pfahler. One of these methods depends on symptom-complices, which, as the name suggests, are only groups of symptoms. The second is based on the contention that bismuth will adhere to the surface or lodge in the crater of an ulcer, a theory which has led to many erroneous diagnoses. The method described and employed by me, and adopted also by George, of Boston, depends on recognising permanent and constant deformities of the cap, by means of serial radiography in at least 36 radiographs. These findings are as constant as one's finger-prints in a ball of putty, and consist of indentations in the contour of the cap, or cicatricial contraction around the crater of an ulcer. The involvement may be so small as to cause only a dent in one side of the cap, or so extensive as to distort it beyond recognition. The puckering, pouching, and narrowing of the lumen, described by Moynihan and Codman, and Hemmeter's "bullet-hole" crater, are all demonstrable by this method. The old healed lesions observed by Codman are also visible radiographically, although sometimes difficult to differentiate from active ulcers. A positive differential diagnosis between post-pyloric (duodenal) ulcer and gall-bladder infection cannot always be made exclusively from the radiographic findings. Distinguishing between these conditions is, however, of more scientific interest than practical value, because in either case surgery is indicated if the lesion is sufficiently extensive and associated with severe symptoms. Adhesions from post-pyloric (duodenal) ulcer may involve other regions, giving symptoms referable to the colon, gall-bladder, or stomach. The diagnosis of post-pyloric ulcer by serial radiography is equally as accurate as the radiographic diagnosis of renal or ureteral calculus. The radiographs must be studied individually and collectively, and either matched over each other or reproduced cinematographically. Applying the principle involved in serial or cinematographic radiography to plain radiography, where only two or three, or even a dozen, radiographs are made, will unquestionably lead to erroneous diagnosis, and thereby cast discredit upon the method of examination.

Dr. A. H. PIRIE (Montreal) read a paper on

The Variations in the X Ray Appearance of Normal Stomachs.

He pointed out that there can be no one form that can be said to be normal, since its shape depends on what it contains and how it is carried. At the same time, a line drawn from the cardiac end to the pylorus was fairly constant in regard to its angle with a perpendicular through the spine. He showed tracings of a large number of presumably normal stomachs, all of which varied in detail, and at the end was demonstrated a cinematograph film showing the peristalsis at the pyloric end very beautifully, which had been prepared by Dr. ROSENTHAL (Munich).

Mr. C. THURSTAN HOLLAND (Liverpool) read a paper on his

Statistics of Examination for Stone in the Urinary System.

1707 cases were analysed and he gave detailed results and statistics of all his findings. As regarded kidneys and ureters only, 1603 cases, stones were found in 402, or 1 in 4. In only 12 cases were any errors, and of these 4 were cases of wrong interpretation of the plates. Eighty-five negative X ray results were explored by operation and in not one was a stone found as the cause of the symptoms. In 116 other cases of negative diagnosis, not operated upon, other causes were eventually found for the symptoms. The author considered that the occurrence of pure uric acid calculus as a surgical condition was extremely rare, which was fortunate considering that the X ray method is incapable of demonstrating their presence.

SECTION XXIII.—HISTORY OF MEDICINE.

THURSDAY, AUGUST 7TH.

President, Dr. NORMAN MOORE (London).

In his presidential address on

The History of Medicine in England

Dr. NORMAN MOORE said that the founder of the study of the history of medicine in England was Dr. John Freind, who was born in 1675, educated at Westminster and Christchurch, died in 1728, and has a monument in Westminster Abbey. He sat in Parliament for Launceston in 1722 as an active Tory. He was sent to the Tower in 1723 with Atterbury, Lord Orrery, and the Duke of Norfolk, on suspicion of being implicated in the Jacobite plot, but he was released, as there was no evidence against him. It was during this incarceration that he planned and began his "History of Physick from the time of Galen to the Beginning of the Sixteenth Century," and

dedicated it to Dr. Mead in acknowledgment of the latter's friendship and of the kindness shown him by the Faculty when he was apprehended to be in danger. Freind, in the first volume of this work, explains the contributions to medicine of Galen's immediate successors—Oribasius, Retius, Alexander Trallianus, and Paulus Aegineta—and shows the Arabians' debt to them. The plague of Justinian's time, the medical merits of St. Luke and St. Basil, and Harvey's discovery of the circulation of the blood, all form interesting episodes in Freind's narrative and are treated with great learning and skill. The volume concludes with an account of Palladius and later Greek physicians. In the second volume the Arabian school is dealt with, and it contains an admirable summary of the additions made by that school to medical knowledge. A description of the school of Salernum is followed by an account of the English mediæval writers, Gilbertus Anglicus, John of Gaddesden, Mirfeld, and Arderne. The plague of 1348, the sweating sickness, the scurvy, lues venerea, gunshot wounds, lithotomy, and anatomy engage the author's attention. He ends the volume with an account of Linacre and of his influence on subsequent medicine and physicians. Systematic medical biography began with the "Bustorum Aliquot Reliquiae" of Dr. Baldwin Harvey, and was continued by John Aikin, by Dr. Munk in his "Roll of the College of Physicians," and by the numerous articles in the "Dictionary of National Biography." The College of Physicians, founded in 1518, initiated constant relations between contemporary physicians in England, and linked them with those of the past and the future in a continuous stream. Starting from the study of Hippocrates' observations of nature, the College soon went on to experimental research, the first great result being Gilbert's discovery of the magnetism of the earth; the second, Harvey's discovery of the circulation; then followed Glisson, the pathologist, and Sydenham, the clinical observer, who may justly be regarded as the founder of the noble school of public health which exists in England. Finally, Matthew Baillie, the morbid anatomist, Sir William Jenner, Wilks, and Gee were treated of in succession, and especial mention was made of John Hunter, who established surgery as a scientific study in England, raising it from a mere discussion of method to the status of a true part of medicine, a true predecessor of Lister. Dr. Moore concluded by pointing to the many directions in which the history of medicine might be pursued, the variety of learning that might be brought to bear on it, and the relation it bore not only to the practice of medicine and surgery and to pathology, but to all allied subjects and the study of history at large.

(To be continued.)

THE MUSEUM.

The Museum of the Seventeenth International Congress of Medicine, housed in two laboratories on the top floor of the Royal College of Science, illustrated much of the recent work in medicine and the allied sciences that had accrued since the last congress in Budapest in 1909.

The main idea of the organising committee was to provide practical demonstration of the subject-matter discussed at the various sectional meetings. In addition, loan museums dealing with medical matters were on view, together with a most instructive series of exhibits dealing with museum technique from beginning to end.

A first glance at these two laboratories, with all their available space filled, hinted at the enormous energy and perseverance required to crystallise the committee's idea; a fuller examination evoked feelings of admiration for the determined manner in which success had been attained. Everywhere evidence of the guiding hand of that experienced and versatile organiser, Mr. H. W. Armit, was to be found. To him we owe gratitude, not only for the vast preliminaries entailed in collection and arrangement, but also for his translation of the 200 page catalogue into French and German, and also for his frequent presence during the days of the exhibit as guide and friend to the many visitors present. The committee was lucky indeed in having him as secretary.

Without entering into detail here the general ideas gleaned from a first view were the following. Firstly, the technical skill of the exhibitors, and here our memory chiefly recalls preparations from abroad which often typified the race that produced them; secondly, the protean aspects of medical science and the dogged search for truth along so many paths; then the everlasting pursuit of the direct and contributory causes of disease and the signal triumphs in mitigation and prevention gained by such of this investigation that bore success; and finally, the idea of teaching that permeates the modern museum.

Museum Technique.

It was quite fitting that our attention should be drawn in the first instance to the apparatus of museum technique and the several methods of preserving the original colour in specimens to be mounted and their indexing. Thus we were shown within a museum the numerous processes required in the formation of a museum. All the methods of colour preservation seemed to be successful, but there was no indication of the cost which is always a consideration with at any rate the smaller London hospitals. A comparison from this point of view would have been of much value.

Coronal and transverse sections through the entire thorax, as shown by Professor Hauser, indicating the lesions occurring in continuous viscera in that one plane without disturbance of parts, are a great advance on the usual methods of displaying a single viscus. These sections were particularly instructive in cases of pleural effusion and extensive cavitation of the lung. But here in England we doubt whether popular sentiment would allow many specimens of this kind being secured.

Professor Spalteholz showed a large series of bones, hearts, and other viscera, which had been rendered transparent by passing through benzoline and mounting in oils—a most novel method of bringing out certain features such as the arrangement of cancellous tissue of bone and the process of ossification in fœtal skulls, the centres having been previously acted on by a selective stain. Professor Wahby's preparations of the vascular system obtained by metallic or celluloid injection and subsequent solution of the surrounding tissues were very prominent. A combination of injection and Spalteholz method gave a vivid picture of the vascular systems in small fishes and rats.

Hygiene and Preventive Medicine.

Under this heading came an important exhibition, arranged by Dr. E. Collis, to show the effects of dust—mineral, metallic, and animal—in producing pulmonary diseases. Here we found many of the processes illustrated, specimens of the raw material used, and samples of dust from the worker's benches or rooms, and numerous macroscopic and microscopic preparations of tissues obtained from man and animals after long-continued inhalation of foreign particles. In addition to these, statistical figures indicating the prevalence of phthisis and other facts were at hand.

It was interesting to know the "asthma" of those engaged in stripping cotton-carding machines, the comparative freedom of coal-miners from phthisis, and the great value of radiograms in estimating the amount and distribution of the fibrosis.

Surely these workers in dusty trades—and the list is a very long one, including, as it does, stone dressers, flint knappers, ganister and other miners, potters, granite cutters, plaster-of-Paris workers, and many others—deserve our sympathy and whatever protection we can devise. Much has been done to reduce the prevalence of pneumoconiosis by efficient dust removal, adequate ventilation, and the conversion of former dry methods of grinding and drilling into wet ones. But all the devices ever thought out will fail unless they meet with the intelligent coöperation and not the carelessness or indifference of the workers themselves.

Progress in the prevention of beri-beri was shown by a series of charts. One depicted its gradual abolition in the prisons of the Malay Peninsula on the substitution of whole rice for white, and another showed a fall in the death-rate from 421 per 1000 before to 5 per 1000 after the abolition of white rice amongst the Christmas Island coolies. These conclusions were corroborated by photographs of pigeons showing their suffering from experimental polyneuritis and their cure by appropriate dieting.

Cancer.

The work of cancer researchers was illustrated from many aspects. Induced and abnormal mitoses were shown by models, photographs, and actual preparations. Experimental cancers in mice and spontaneous cancers in various animals

—e.g., the horse and cow—which indeed were indistinguishable from the human variety, and numbers of statistical tables, formed a contribution from the Imperial Cancer Research.

Cancers of plants were there, too, forming an exhibit by Dr. Erwin Smith. He showed that crown gall—an abnormal proliferation of plant tissues—which was responsible for the destruction of acres of vegetable produce, was infective in nature and intimately connected with an organism he calls the B. tumefaciens. Closely allied to the foregoing is the work of the John Howard McFadden Laboratory, which tends to show that certain cutaneous inflammations and proliferations occurring in pitch and briquette workers are caused by the presence of certain bodies called auxetics and kinetics. Having discovered that these exciting bodies do not occur, or occur only in very small amounts, in certain coal and pitches, their future experiments should prove interesting.

Radium therapy in leukoplakia, superficial carcinomata, and sarcomata was well treated of by Dr. Abbe (New York) and Dr. L. Wickham and Dr. Degrais (Paris). Their plaster casts, photographs, and diagrams were very convincing, and there is no doubt that radium *in suitable doses* leads to remarkable cures in cases where the disease can be approached and where it is not too far advanced. Dr. Abbe by his experiments on wheat and narcissus bulbs clearly showed that radium in unsuitable doses can be as harmful as it is beneficial in the correct dose. He showed that seeds could be devitalised or stimulated, as proved by behaviour on planting after exposure to varying doses of radium.

In this section, as elsewhere, we found the usual fine examples of cancer from all parts. But these, the usual museum specimens, we do not intend to discuss, thinking it better to confine our remarks to the more original and lesser known work.

(To be continued.)

THE EXHIBITION.

The Exhibition held in the Imperial Institute was an unmistakable success and attracted a very large number of visitors. The discussions at the various stalls were quite animated in regard to the merits of the surgical appliances, electrical apparatus, biological outfits, ultra-microscopes, drugs, vaccines, and so forth, which were displayed in great profusion. There was, indeed, much to see of real professional interest, and it was easy to note that the occasion was appreciated as one which afforded the medical man an excellent opportunity of inspecting recent developments in various important branches of medicine. Surgical appliances and scientific apparatus were perhaps greater in evidence than other classes of exhibits, although each section was interestingly represented. The electrical exhibits proved a source of considerable attraction, the display of X ray apparatus, high-frequency machines, diathermic apparatus, cauteries, transformers, and switchboards being very complete. Biological apparatus, including ultra-microscopes, formed also an interesting and important section of the exhibition, while demonstrations were given at intervals illustrating the value in medical research and education of the epidiascope, an apparatus for the direct projection in natural colours of microscopical slides, lantern slides, spectra, pathological specimens, and so forth. The display of drugs was relatively speaking a small one, but none the less interesting, serving in most cases to illustrate the attention being given to the preparation of elegant forms of administration. Metal-colloids, organo-therapeutic preparations, vaccines and sera, were a feature of this section. For the most part the special foods were familiar friends, including diabetic foods, soluble meat preparations, and milk-derived compounds. There were several exhibits illustrating advances in sanitary apparatus, which included a number of new hospital appliances, as, for example, hospital sinks, lavatories, stoves, and a specially designed lavatory for the operating theatre. The stalls were broken up here and there by examples of recent medical literature, the leading publishers being well represented. It is obvious from this short introductory review of the exhibits that the whole collection offered a wide range of objects possessing interests in many important directions. Altogether there were about 180 exhibitors represented and not far short of 200 stalls.

In presenting a somewhat extended account of the more important exhibits it is convenient to adopt a classification of them into the following sections:—I., Electrical and Optical Apparatus; II., Surgical Instruments and Appliances and Hospital Accessories; III., Drugs and other Therapeutic Agents; IV., Special Foods; V., Sanitary Appliances; VI., Mineral Water and Beverages; VII., Literature.

I. *Electrical and Optical Apparatus.*

The electrical and X ray section occupied to the exclusion of other classes of exhibits the left-hand annexe. The demonstration was an imposing one, and some very fine electrical apparatus was shown. Immediately facing the visitor as he entered this section, and at the end of the annexe, was a very fine collection of X ray transparencies by Messrs. Siemens Brothers and Co., Limited, of Caxton House, Westminster, S.W. Here was shown their latest type of universal single flash outfit for all X ray work, quick and instantaneous radiography, as well as for single exposures. There were also shown a series of X ray bulbs fitted with tungsten anti-cathodes, a special screening apparatus (Levy Dorn), and a diathermy apparatus for the application of heat at any desired depth in the body. The exhibit included an electrocardiograph and a collection of tantalum dental instruments and apparatus adapted for treatment by radium activities. The Veifa Works, of Frankfort-on-Main, exhibited some admirably designed apparatus, amongst which were prominent Dessauer's one-flash X ray apparatus, an X ray kinematograph by which, amongst other things, it is possible to determine which phase of the heart or respiration each individual picture corresponds to. There was also shown a universal diathermic apparatus adapted for local thermopenetration by means of electrodes, or general diathermic treatment in a four-cell bath. Special X ray tubes were the feature of the stall of M. H. Pilon, 53, Rue de Paris, Asnières, Seine, France. In some instances these were fitted with a tungsten or a platinum target. Messrs. L. Drault and C. Raulot-Lapointe, of 73, Rue Dutôt, Paris, exhibited a number of ingeniously designed apparatus for use in radiology besides other electrical instruments, as, for example, a cautery and a medical search-light. The Cambridge Scientific Instrument Company's exhibit (Cambridge, England), contained a variety of interesting apparatus, including that designed for electrocardiography, which has already been referred to in our columns, an apparatus for phonocardiography, and a number of useful apparatus in experimental physiology. Amongst the last may be mentioned a motor-driven kymograph, a laboratory chronograph, a tuning-fork contact maker, a muscle trough (for overcoming trouble due to the drying of tissues used in experiments on muscle and nerve), and several types of microtomes. There were some interesting examples of electrical apparatus designed to assist the deaf to hear shown on the stall of Acousticons, Limited, of 353, Oxford-street, W., besides telephones and microphones for special purposes.

A comprehensive and useful exhibit of electrical apparatus was presented by Messrs. Schall and Son, of 71 and 75, New Cavendish-street, W., who joined for the purposes of demonstration with Messrs. Reiniger, Gebbert, and Schall, of Berlin and Erlangen. Besides X ray installations and accessories displaying much skill and ingenuity, and effecting beautiful results even by a single flash of 1/100th of a second duration, there were shown also an excellent type of high-frequency apparatus, an apparatus for thermopenetration, also one for galvanisation and faradisation, and another for the treatment of obesity. The exhibit included several types of cautery burners and electric lights for surgical exploration. Yet another admirable series of electrical apparatus was shown by the Sanitas Electrical Company, Limited, of 61, New Cavendish-street, W. Chief amongst these was a complete "sanax" X ray outfit for rapid radiography, flash and instantaneous exposures or time exposures for radioscopic and therapeutic study. The outfit renders the application of X rays most convenient and effectual. There was besides the "multoscope," comprising a tube stand and blend box for diagnosis and treatment, an operating table for exposures and penetrations in a horizontal position, a frame for the examination of patients in a sitting or standing posture, and an appliance for compression and an orthodiagraph. A recent apparatus for diathermic treatment was shown, called the penetrotherm, which, it is stated, overcomes the drawback

of previous designs due to defective and irregular action of the high-spark gap. The multostat provides an apparatus for the administration of various electric currents to the body. Ionic medication, 4 cell-bath treatments, galvanic faradisation, cautery, and light may be quoted as evidencing the range of application of this design. Another interesting apparatus shown by this firm was that used in the treatment of obesity, which forces a patient to obtain ample work of the muscle by exciting it electrically. Electricity in the service of dental surgery was illustrated in the electro-pneumatic apparatus for use in the diagnosis and treatment of diseases of the oral cavity at the exhibit of the Dental Manufacturing Company, Limited, of Alston House, Newman-street, Oxford-street, W. Messrs. Gaiffe, of Paris, were represented by the Medical Supply Association of 167–173, Gray's Inn-road, W.C., who exhibited their well-known X ray apparatus with uni-directional current known as the turning commutator. The output of the transformer known as the Rochefort-Gaiffe is described as exceedingly good, and its efficiency of the very highest. The exhibit included a diathermy apparatus and an electrotherapeutic apparatus for activating the muscles.

A very comprehensive exhibit of optical apparatus was that of Messrs. E. Leitz, of 18, Bloomsbury-square. The advantages of special construction in regard to their microscopes were abundantly demonstrated in a series of mounted objects. The new dark-ground condenser for the observation of living and unstained specimens should be mentioned. The objects are brightly illuminated against a dark ground. This method is valuable for the early diagnosis of syphilis, the observation of typhoid bacilli during the Widal reaction, of fresh unstained blood films for trypanosomiasis, and the investigation of the most minute micro-organisms. There were also shown an ultra condenser for the observation of ultra-microscopic particles, and special apparatus for projecting lantern slides, microscopical slides, and opaque objects. A demonstration of the large epidiascope was given from time to time. The advantages of a new apparatus (Havem-Sahli) for the examination of the blood were practically pointed out. Altogether this was one of the most interesting stalls in the exhibition. Mr. E. B. Meyrowitz, of 1A, Old Bond-street, exhibited the Morton-Marple electrically lit ophthalmoscope. The mirror is very thin with a slot cut right through the glass, a device which is said to obviate all annoying corneal reflections. There was an interesting series of optical apparatus at the stall of Messrs. C. Reichert, of Vienna, who were represented by their agents, Messrs. H. F. Angus and Co., 83, Wigmore-street, Cavendish-square, London, W. Amongst the novelties may be mentioned the fluorescence microscope for the study of objects in fluorescent light. By this means it is stated that it is possible to differentiate and determine chemical differences in unprepared objects, which by ordinary methods of illumination appear homogeneous and colourless. Most substances, but especially those of organic origin, so illuminated fluoresce; the "comparison ocular," is an instrument affording a ready means of viewing and comparing in one field objects under two distinct microscopes standing side by side. Amongst the interesting instruments exhibited by Messrs. George Spiller, Limited, of 32, Wigmore-street, London, W., were some ophthalmic lamp standards; the orthoscope, an automatic combined ophthalmoscope and retinoscope, which shows five discs width of evenly illuminated fundus; and the Maddox phorometer, a hand instrument designed for the ready and accurate diagnosis of muscular insufficiencies, besides some new models of spectacles and eyeglasses. The Tintometer Company, Limited, of Salisbury, exhibited the instrument invented by Lovibond for measuring and recording the colours of gases, liquids, and solids. This pretty device has found many valuable applications in commerce as well as in science. Messrs. Bruce, Green, and Co., of 14–18, Bloomsbury-street, London, W.C., had a number of interesting optical appliances on view—trial cases, frames, facial measuring sets, and the Wyche portable lamp for eye, nose, ear, or throat work may be mentioned. There were many attracted to the stall of the well-known Jena firm, Messrs. Carl Zeiss, Limited, of 13 and 14, Great Castle-street, London, W., who exhibited a number of microscopes of different patterns with apochromatic and achromatic objectives. Amongst novelties which may also be mentioned were a micro arc-lamp, a micro Nernst lamp, and a micro gas lamp. The exhibit included ophthalmoscopes, an exophthalmometer, and an inter-pupillary distance gauge.

II. *Surgical Instruments and Appliances and Hospital Accessories.*

The majority of the exhibits fall under this inclusive heading. It is not possible in the space at our disposal to present a complete review of the many articles of interest shown, but an attempt may be made to refer to those which had distinct claims to novelty and utility. Messrs. Allen and Hanburys, of 48, Wigmore-street, Cavendish-square, London, W., had many appliances of interest to the surgeon. Their portable operation table, known as the Waring table, may be mentioned. One form of it is made throughout of seamless steel tubing, all the joints are brazed, the top of the table being made of aluminium, the frame part aluminium enamelled. There was also a selection of instruments shown for the operative treatment of fractures, and amongst them a bone-holding forceps designed by Sir W. Arbuthnot Lane. Messrs. Mayer and Meltzer, of 71, Great Portland-street, London, W., had a very wide choice of surgical and hospital appliances on view. Prominence was given to the "Emandem" aseptic portable operation table, described as "firm as a rock and light as a feather," and an instrument tank for sterilising instruments by immersion in alcohol. Messrs. Short and Mason, of Walthamstow, London, N.E., showed on the stand of the Cambridge Scientific Company the "Tycos" sphygmomanometer, which offers a new and sound device for determining both the diastolic and systolic readings of arterial blood pressure. The Surgical Manufacturing Company, of 85, Mortimer-street, London, W., showed some new models of portable operation tables which they have recently brought to the notice of the profession, and a high pressure steriliser with vacuum attachment known as the Surgman steriliser. It is automatic in use, and is said to render dressings or instruments sterile and dry in 30 minutes at the cost of a few pence. Messrs. B. Braun, of Melsungen, Germany, and 41, Berners-street, London, W., exhibited many specimens of sterile catgut Kuhn, the merits of which were recently referred to in our analytical columns. Admirable precautions are taken to use healthy gut as well as to render it sterile.

Close by was the full stall of Messrs. Schaerer, of 41, Berners-street, London, W., who showed amongst other things a rib retractor of specially strong construction for thorax operations, and also rib shears which are described as strong working, giving a clean cut while being handled without great effort. Another interesting demonstration here was the suture apparatus (after Hahn) for stomach and intestinal resection. Amongst the claims put forward in favour of this apparatus are: (1) considerable shortening of the time of operations; (2) a perfectly secure and even suture; (3) perfect hæmostasis; and (4) perfect asepsis. Messrs. J. Nesbit-Evans and Co., of Floodgate-street, Birmingham, drew attention particularly to their latest improved bedstead for abdominal operations. The bed has an independently adjusted knee-rest portion, in addition to an independently adjusted head portion. A wheel is used to adjust either head-rest or knee-rest, while the bedstead can be used as an ordinary bed, since the spring surfaces can be brought to the level. Another excellent and simple design is the wheeling-out bedstead, which is in very extensive practical service. The appliance to which most attention appeared to be given at the stall of Messrs. John Ward, Limited, of 246 and 247, Tottenham Court-road, London, W., was the "Wardway" staircase chair, designed for the easy and ready conveyance of invalids, not merely from room to room, but up and down stairs, which renders it of the utmost value in private nursing. There were besides the Kingsway adjustable couch, providing for the comfort of surgical and medical cases, and a most comfortable and artistically constructed chair known as the Charterhouse reclining chair. We have already referred to the interesting exhibit of microscopes by Messrs. Carl Zeiss. On the same stall Messrs. Lautenschläger, of Berlin, exhibited a number of biological apparatus which offered advantages. Amongst these were some special incubators, sterilisers, and autoclaves showing improvements in design and efficiency of purpose. There were also in the same group urethroscopes, cystoscopes, œsophagoscopes, and other "scopes," aids

in surgical exploration exhibited by Messrs. Wolf, of Berlin. Blood pressure measuring apparatus was chiefly in evidence in the exhibit of Messrs. E. Zimmermann, of Leipzig and Berlin, at the same stall. One instrument was shown by which three different tracings can be recorded simultaneously, showing blood pressure, pulsation and action of arteries or veins, or blood pressure, pulsation and action of the heart or carotids. This group was completed by the microtomes of Messrs. R. Jung, Heidelberg.

The Medical Supply Association, 167–173, Gray's Inn-road, London, W.C., made a feature of their improved sterilisers (Macdonald) for dressings. The efficiency of the apparatus is demonstrated by a test on anthrax spores in dressings, which former were killed in from 10 to 15 minutes. A very ingenious series of atomisers was shown by The De Vilbiss Manufacturing Company, Toledo, Ohio, U.S.A. These are adapted for producing a spray from any liquid, oily or aqueous. There were further shown examples of insufflators and nebulisers (oil). The very fine division into particles which these appliances produce is much in their favour in the treatment by spray of the nose and throat. At the stall of Messrs. Philip Harris and Co., of Edmund-street, Birmingham, prominence was given to "pexuloid," a substance suitable for the material of artificial supports. Its lightness is a convenient quality, a full-sized spinal support for an adult being said to weigh 14 oz. only. It is, further, non-inflammable, clean, and durable. The exhibit included a well-designed apparatus for the preparation and manipulation of carbon-dioxide snow, and some special pharmaceutical preparations. Some excellent examples of elastic hosiery, trusses, and abdominal supports formed the subject for inspection at the stall of Messrs. Walton and Curtis, of 190, Broadhurst-gardens, West Hampstead, London, N.W. A special article shown was the Curtis abdominal support, which is claimed to afford complete control of the lower abdomen and its contents. Enteroptosis, visceroptosis, and intestinal stasis are amongst the conditions quoted in which the use of this support is appreciated. There was a variety of apparatus on the stall of the Holborn Surgical Instrument Company, Limited, of Holborn-circus, London, E.C., and one that attracted considerable attention was the apparatus designed by Mr. C. M. Page, F.R.C.S., for the intravenous administration of hedonal for producing anæsthesia. A well-constructed saline infusion apparatus was shown here, and floating labels (glass tubes with a clearly printed label inside and hermetically sealed) — decidedly convenient and useful for marking the contents of various receptacles essential in the operating theatre. We have referred in our columns to the patent capsule of Messrs. Charles Hearson and Co., of 235, Regent-street, London, W., designed for the exact regulation of the temperature of incubators. Several examples of incubators were shown, including those controlled by gas, oil, or electricity. These incubators are indispensable in biological work. The new Anhydric electric incubators and ovens are adjusted for blood heat (37° C.), for embedding (45°–60° C.), for drying purposes (90°–110° C.), and for sterilising (150°–175° C.). Messrs. Claudius Ash, Sons, and Co., Limited, of 5 to 12, Broad-street, Golden-square, London, W., made school dental clinic outfits a special feature of their demonstration—a subject of obvious importance. There were besides some anæsthetic apparatus offering decided advantages. Lastly should be mentioned the "visible electric steriliser," a coil kept hot by the electric current, which raises water to the boiling-point when immersed in it. Messrs. Hawksley and Sons, of 357, Oxford-street, London, W., showed an improved sphygmomanometer fitted with a non-spillable tube, in which the annoying escape of mercury arising from loss of rubber caps, &c., is avoided. There were several types of sphygmomanometers shown, amongst which were good examples of a recording apparatus. Besides were several polygraphs and hæmoglobinometers and acoustic instruments to help the deaf. There was a good assortment of surgical dressings on the stall of Messrs. Arthur Berliner, of 15 and 17, Worship-street, London, E.C., amongst which may be mentioned absorbent and antiseptic cotton wools and one impregnated with capsicum and wintergreen.

Aseptic dressings packed in hermetically-sealed tins formed an important exhibit brought to the notice of the visitor by Messrs. John Bell and Croyden, Limited, of 50, Wigmore-street, London, W. In addition there were some specially constructed catheters and a shadowgraph bougie impervious to the X rays giving a sharp and deep black line on the screen or in a photograph. They also showed a new form of material for producing an oxygen effervescent bath, which, while giving a regular supply of oxygen, leads to no discolouration in the bath due, in the case of certain powders, to decomposition of a manganese compound. Messrs. Pocock Brothers, of Southwark Bridge-road, London, S.E., gave illustrations of a speciality of theirs—viz., padded rooms which have been approved by the Commissioners in Lunacy, and which are in use at the London County Council asylums. They also showed tubular beds constructed to relieve local pressure on the body. A further advantage is that a bedpan or other vessel can be used without disturbing the patient. Any damage, moreover, to the bed can be quickly remedied by the use of squares, the bed consisting of ten tubes. Amongst the comprehensive collection of surgical instruments exhibited by Messrs. John Weiss and Son, Limited, of 287, Oxford-street, London, W., was a very complete set of apparatus of service in ophthalmological practice and designed in many instances by Mr. Bishop Harman. Amongst the general instruments were anæsthetic apparatus, artery forceps for deep-seated vessels, and new forms of cystoscopes. The Scholl Manufacturing Company, Limited, of Giltspur-street, London, E.C., exhibited interesting examples of their "foot specialities" and orthopædic appliances comprising a tri-spring arch support for severe cases of flat-foot or heavy persons, a foot-rest with German silver supporting plate and sponge rubber heel cushion, an anti-bunion spring, and corset ankle supports for weakened ankles. A remarkable exhibition of clinical thermometers was given by Mr. G. H. Zeal, of 82, Turnmill-street, London, E.C., who adopts normal glass in their manufacture, which avoids contraction and so ensures accuracy of observation. The "repello" thermometer was also shown which is re-set simply by pressing a flattened bulb at the top. This is supplied with a magnifying lens, while a case is provided which keeps the thermometer aseptic. Medical and surgical plasters representing the latest developments in these indispensable accessories formed an interesting exhibit by Messrs. Leslies, Limited, of 18, Eldon-street, London, E.C. Amongst special things may be mentioned the diachylon base, a hospital strapping on brown holland, an adhesive plaster, a rubber adhesive on spools and in rolls, and various plasters containing well known medicaments—e.g., belladonna, mercury, opium, capsicum, menthol, cantharides, and mustard.

Some practical oxygen apparatus for medical and surgical use was shown by Messrs. Richard Jacobson, of 70, Shoe-lane, London, E.C. A recent development of the oxygen narcosis apparatus combines it with a device which enables the operator to apply artificial respiration in the event of the patient collapsing under the anæsthetic or during the operation. A further extension is seen in the narcosis-resuscitation apparatus for operating under supernormal pressure. There were also many forms of oxygen inhalers shown at this very interesting exhibit. The Société Française des Tissus "Tetra," Paris (London: V. R. Hilfiger, Angel Court, 8, Friday-street, E.C.) showed specimens of their "tetra" bands and compresses made with the very absorbent "tetra" gauzes. Close by Messrs. Walter Oehmke, of 21, Luisen Strasse, Berlin, showed some cleverly devised apparatus for the examination of blood-vessels. The exhibit included a blood pressure recorder, a new venous pulse recorder, and an apparatus for photographically registering the arterial and venous pulsation and heart beat. At the adjoining stall the Inhabad Co., Limited, of 9 and 12, March Strasse, Charlottenburg, Berlin, explained their systems of inhaling, which have considerable vogue in hydros and sanatoriums. Several forms of lifting apparatus for hospital and private use were exhibited by the company of that name (49, Ulundi-road, Blackheath, S.E.). The patent recumbent invalid lifters are made in several types, including a sacrum lifter, a lifting cushion (for bed pan), an "inclinator," and a "fracture and dysentery mattress." An interesting exhibit was that of Messrs. John P. White and Sons, Limited, of Pyghtle Works, Bedford, who showed a number of patent flush fire-resisting composite doors finished with a plain surface in teak, walnut, or mahogany suitable for hospital use. A hygienic claim is very properly made for these doors, since they are free from corners in which dirt can accumulate.

There was a variety of surgical dressings at the stall of Messrs. Cuxson, Gerrard, and Co., Limited, of Oldbury,

Birmingham, including lints, plain and sterilised or antiseptic, boric acid treated, double cyanide, sal alembroth, and so on. To these may be added a series of gauzes, bandages, and compressed dressings. The Stille-Werner Company, Limited, surgical instrument makers, of Stockholm, Sweden, had a neatly arranged exhibit of their specialities, including also aseptic hospital furniture, a new universal operating-table and stools, and an extension table and suspension apparatus designed by Waldenström. Close by Messrs. E. Cogit et Cie., of 36, Boulevard St. Michel, Paris, showed examples of their bacteriological and microscopical appliances, while Mr. R. B. Turner, of 11 and 12, Foster-lane, London, E.C., had an exhibit a little further on illustrating his designs in aseptic surgical and medical glassware for hospitals, laboratories, and sanatoriums. There were also shown vaccine syringes, bulbs, and bottles and pipettes designed by Sir Almroth Wright. Sterile catgut, sterile bone wax, sterile blood-vessel sutures, with needle, and sterile horsehair were amongst specialities of the De Witt Luken Company, shown by Mr. Joseph Davis, of 13, Poland-street, London, W., while at the same stall there were a number of hypodermic syringes and thermometers and atomisers, manufactured by the Randall-Faichney Company. Mr. Sidney P. Holloway, of 115, Richmond Park-road, Bournemouth, exhibited tests for heterophoria in near and in distant vision, an ingenious electric resistance for applying continuous dry heat and an improved axis-finder for cylindrical lenses. Amongst novelties shown by Messrs. Louis and H. Loewenstein, of 28 and 29, Ziegelstrasse, Berlin, were cystoscopes with bright optical attachments for exploration, and some convenient apparatus for electro-therapeutic use. Lastly, Mr. W. Longmate, of 56, Weymouth-street, Portland-place, London, W., exhibited a series of surgical appliances made with a non-inflammable material, artificial limbs, spinal supports, splints, and corsets. The claims made in favour of these non-inflammable surgical appliances appear reasonable, as it is obvious that they can be used with certain advantages compared with leather or poroplastic. Steel supports are not required and the appliances are very light in weight, easily adaptable to shape, and therefore comfortable.

(To be concluded.)

THE CLOSING MEETING.

The Congress met for the last time in general session at the Albert Hall on Tuesday, August 12th, at 3 P.M. The Address on Public Health was delivered by the Right Honourable JOHN BURNS, President of the Local Government Board, before a large and appreciative audience, and will be found in full in this issue of THE LANCET.

There is always something pathetic in the closing meetings of these great international congresses. The ceremony is generally held in the same hall as that in which the inauguration took place, but the audience has sadly dwindled. For the inauguration everyone is present, from the closure more than half the members are absent, a large number having already hurried home. At the opening all is expectation, and the colour of uniforms and the glitter of orders make the scene gay. At the closure stars and tunies are already packed, and their owners wear customary solemn suits. Expectation is replaced partly by a genuine feeling of gratitude for hospitality received and partly by frank relief that an over-strenuous interlude has terminated. Thus it happened in the Albert Hall on Tuesday afternoon that there were so few persons present, that the ordinary members of the Congress were early invited to take the seats which had been reserved for Government representatives, the delegates of universities and societies. Doubtless many more persons not members of the Congress, but belonging to the general public, would have attended had they been able to obtain admittance, but they were all rigorously excluded, as the presence of a Cabinet Minister brought with it a risk of some outburst on the part of the suffragettes. In fact, there was a small disturbance of this sort. At 3 o'clock Mr. Burns commenced his address, and had hardly read ten lines when a woman from the gallery shouted, "John Burns, I protest against your standing here in the name of the Government; I protest." During the next 20 minutes six different women and one man interrupted the proceedings, but on their expulsion peace prevailed and Mr. Burns was able to read the rest of his speech in quietude, and concluded punctually at 4 P.M.

As Mr. Burns described how successfully typhus fever had been stamped out of this country there was applause, and the allusions to the work of Chadwick, Farr, Pasteur, and Manson were similarly greeted. And when Mr. Burns said that "happily there are signs that medical research will be assisted by the State in future on a scale not previously contemplated," the applause was prolonged. Mr. Burns, at the end of his eloquent address, raised the enthusiasm of his audience by adding a few words to his written speech, when protesting against the wastefulness of armaments. He presented himself as an artisan who, by the confidence of his fellow countrymen, had been raised to the position of a Cabinet Minister. It was in the name of his fellow working men—the men who worked in the pit, the factory, the mill—that he wished to thank the medical profession for all the care they had bestowed on the lowly and the weak. Might medical men, he added, still continue to be inspired by the best traditions of the great profession to which they belonged. If they would temper the spirit of Sydenham with that of Robert Owen, of Shaftesbury, and Florence Nightingale, they would distinguish themselves as much in the work of rescue as the boldest of soldiers.

After a short interval the proceedings at the closing meeting commenced.

The report of the Permanent Commission of the International Medical Congress, including resolutions sent up by the sections, was read in French by the General Secretary of the Permanent Commission, Dr. H. Burger.

The report was as follows:—

At its meeting on Friday, August 8th, the Permanent Commission of International Congresses of Medicine carried the following resolution:—

Re the Eighteenth International Congress of Medicine.

The Commission unanimously decided to accept the invitation of the Bavarian Government and of the Town and University of Munich to hold the next International Congress of Medicine in that town in 1917.

The Commission further accepted the recommendations of the committees appointed to award the Congress prizes as follows:—

A. The Moscow prize, awarded to Professor Charles Richet, of Paris, for his work on anaphylaxis.

B. The Paris prize, awarded to Professor A. von Wassermann, of Berlin, for his work on experimental therapy and on immunity.

C. The Hungary prize, awarded to Sir Almroth E. Wright, of London, for his work on anaphylaxis.

At its meeting on Monday, August 11th, the Permanent Commission of the International Congress of Medicine carried the following resolutions:—

I. The Committee of the Permanent Commission was elected as follows:—

President: Professor Dr. Friedrich von Müller, of Munich (President Elect for the Eighteenth Congress).

Vice-Presidents: Monsieur Calman Müller, of Budapest (President of the Sixteenth Congress); Sir Thomas Barlow, of London (President of the Seventeenth Congress).

Secretary-General: Monsieur H. Burger, of Amsterdam.

Assistant Secretary: D.Ph. van der Haer, of the Hague.

Member: Monsieur L. Dejace, of Liège (President of the International Association of the Medical Press).

II. Resolutions of the Sections.

The following resolutions have been sent up by the Sections of Congress:—

A. By the combined Sections of Dermatology and Syphiligraphy (XIII.) and Forensic Medicine (XIX.).

That, sensible of the ravages wrought by syphilis in the health of the community, and deploring the inadequacy of existing facilities for checking its dissemination, the International Medical Congress calls upon the Governments of all the countries here represented—

(1) To institute a system of confidential notification of the disease to a sanitary authority, wherever such notification does not already obtain.

(2) To make systematic provision for the diagnosis and treatment of all cases of syphilis not otherwise provided for.

B. By the Section of Tropical Medicine and Hygiene (XXI.).

a. The section is of opinion that beri-beri among natives who live principally on rice is brought about by the continuous and too exclusive use of rice submitted to a too complete milling, which removes the cortical and subcortical layers of the grain.

b. The section urges all authorities charged with the health of native communities to restrain by every means in their power the use of this rice in the dietary of coolies.

c. In view of the proved non-infectiousness of beri-beri the section suggest that all port and sanitary authorities should abolish foreign quarantine and other restrictive measures against this disease.

d. The section resolves that the malady known hitherto under the name of Malta fever shall in future be named "undulant fever."

All these resolutions will be considered by the Permanent Commission.

C. Resolution proposed by certain sections of the Congress:—

That this Congress records its conviction that experiments on living animals have proved of the utmost service to medicine in the past, and are indispensable to its future progress. That, accordingly, while strongly deprecating the infliction of unnecessary pain, it is of opinion, alike in the interests of man and of animals, that it is not desirable to restrict competent persons in the performance of such experiments.

III.—The Permanent Commission proposes this resolution to the Congress:—

The Permanent Commission, considering that the hospitality of its English colleagues has surpassed all expectations, and considering that this gigantic Congress has been admirably prepared and organised, expresses its sincere and profound gratitude to the

committee of Congress and in their persons to the whole medical profession of England.

The propositions of the Permanent Commission were carried by acclamation.

The PRESIDENT then proposed a vote of thanks from the Congress to the Government of H.M. the Queen of Holland for their generosity in defraying the expenses of the Permanent Commission of the International Congress of Medicine. The vote was heartily accorded.

The official delegates of the governments represented, whose names we have already given, now bade a formal farewell to the President of the Congress in commendably brief terms.

Dr. RAOUL BLONDEL, on behalf of the International Association of the Medical Press, congratulated the organisers of the Congress upon its great success.

Sir THOMAS BARLOW then closed the Congress with a few brief words, the noticeable message of which was that the medical profession should set a united face against the waging of war.

A CANADIAN ADIEU.

The Canadian members of the International Congress of Medicine met on Tuesday morning, August 12th, and unanimously passed the following resolution, which was moved by Dr. J. T. Fotheringham (Toronto) and seconded by Dr. J. M. Elder (Montreal):—

That we wish to offer to the President, Sir Thomas Barlow, to the secretary, Dr. W. P. Herringham, and to the whole committee our hearty congratulations upon the great success which this meeting of the Congress has attained under their kindly and able administration. But particularly as members of the great British family do we desire to express the sense of familiar, homely intimacy which is felt by all of us, enhanced as it is by the presence of so brilliant a gathering of the savants of other climes and races. For as Canadians, revisiting the motherland *coelum non animum mutamus*, we deeply appreciate the real significance of the idea expressed by His Royal Highness Prince Arthur of Connaught in his gracious address of welcome, that all of us of the Empire stood together as hosts to all the rest of those attending. We noted with pleasure the repetition of this idea by the President in his address.

On behalf of the Canadian ladies we wish to thank the committee of ladies here for the profuse and well-ordered hospitality shown by them, and the many arrangements made for the comfort and entertainment of our wives and daughters.

The resolution closed with a hearty expression of thanks and good wishes, and is signed by Dr. W. H. B. Aikins as chairman and Dr. H. B. Anderson as secretary.

AN INTERNATIONAL ASSOCIATION OF ORTHOPÆDIC SURGERY.

During the Congress advantage has been taken of the thoroughly international character of the Orthopædic Section to initiate an International Association of Orthopædic Surgery. A committee, representative of the undermentioned countries, has therefore been formed and authorised to found an international association to further the progress of orthopædic surgery, to correlate the literature of the various countries, and to arrange for the holding of international meetings. The committee consists of the following representatives, all of whom have been present in London: Great Britain, Mr. Robert Jones, of Liverpool; Holland, Professor Murk Jansen, of Leiden; Italy, Professor Putti, of Bologna; France, Professor Kirmisson, of Paris; the United States of America, Professor Lovett, of Boston; Germany, Professor Vulpius, of Heidelberg; Hungary, Professor Dollinger, of Budapest; Canada, Professor Clarence Starr, of Toronto; Russia, Professor Turner, of St. Petersburg; and Austria, Professor Spitzy, of Vienna, who will act as secretary of the committee.

THE TRANSACTIONS.

It has been arranged to supply the complete set of the Transactions of the International Congress of Medicine for a subscription price of £4. Applications should be addressed to the publishers, Messrs. Henry Frowde, Hodder and Stoughton, Falcon-square, London, E.C.

WESTERN INFIRMARY, GLASGOW.—The managers of the Western Infirmary, Glasgow, have appointed Sir George T. Beatson, K.C.B., who recently retired from the position of visiting surgeon, an honorary consulting surgeon to the infirmary in recognition of the valuable services rendered by him to the institution. The vacancy in the visiting staff has been filled by the appointment of Dr. George H. Edington as a visiting surgeon.

ITALY.

(FROM OUR OWN CORRESPONDENT.)

New Temperance Bill.

THE number of cases of alcoholic insanity admitted to the lunatic asylums has almost doubled, and the deaths ascribed to alcohol have increased in a similar proportion. Italy occupies a high place, according to Struve the second place, among the nations in the average consumption of alcohol per head of population. This position is the more serious owing to the frequency with which the wine is adulterated. Di Vestea, examining 146 samples of Italian popular wines, found fusel oil present in all but 9. The legislator, however, is confronted by the difficulty that the vine is cultivated almost all over Italy and constitutes no small part of the riches of the country. The present Bill leaves wine alone, but forbids the sale of drinks which contain more than 21 per cent. of alcohol in any licensed place except with the permission, to be renewed from year to year, of a commission permanently established in each province. These commissions will also decide on the hours during which licensed houses may remain open. The sale of these strongly alcoholic drinks is absolutely forbidden on holidays and on election days, or at any time to persons below 16 years of age. The serving of alcoholic drinks to persons intoxicated or obviously of unsound mind is also forbidden. The importation, manufacture, or sale of absinthe is absolutely prohibited. A person twice condemned for drunkenness or for crime committed in a state of drunkenness shall have his name erased from the lists of political and municipal electors for a period of five years. To limit the number of licensed houses, which in 1909 amounted to 1 for every 159 inhabitants, it is enacted that wherever the licensed houses exceed the proportion of 1 to 500 inhabitants no new house may be licensed.

The Premio Riberi.

An awkward situation has arisen in connexion with the assignation of the Premio Riberi. This, a sum of 20,000 lire, has to be awarded by the Royal Academy of Medicine of Turin to the author of the best work or discovery made during the preceding five years in the field of medical science. The Academy appointed a committee of five members to examine and report upon 12 competing works. This commission was unable to come to a unanimous decision. Two pronounced in favour of Dr. Negri, the discoverer of the "corpi di Negri"; one in favour of Professor Pagliani, an old and important member of the Academy, for his "Treatise on Hygiene," now in course of publication; and two were unable to make up their minds. A meeting of the Academy was called and the reports of the committee presented. In the circumstances a number of members desired further consideration of the matter and supported a motion to adjourn the meeting. Put to the vote there were 19 for and 19 against the adjournment. After this a number of those who had voted for the adjournment left the hall, but the opposition remained and demanded that the sitting should proceed. The remainder of those in favour of adjourning, including Senator Carle, the President-elect, and also the secretary of the Academy, left the hall in sign of protest. The remaining members voted the prize to Professor Pagliani. A further meeting of the Academy was called and referred the decision of the legality of the award to a committee consisting of the President of the Academy of Sciences, the President of the Order of Advocates, and the President of the Court of Cassation of Turin. Unfortunately these gentlemen have declined the honour. A Government inquiry seems the only way out of the difficulty.

Malarial Zones.

The Director-General of Public Health has published the list of malarial districts up to Dec. 31st, 1912. The provinces completely immune from malaria have risen from 10 in number in 1906 to 13 in 1912. They are Ancona, Arezzo, Cuneo, Florence, Genoa, Lucca, Macerata, Pesaro, Piacenza, Portomaurizio, Belluno, Forli, and Massa-Carrara. The last three named are those which have been freed since 1906. There are still 3398 malarial zones divided among 2682 communes.

August 9th.

THE LANCET.

LONDON: SATURDAY, AUGUST 16, 1913.

International Medical Congress: The End of the Meeting.

THE Seventeenth International Congress of Medicine is now over, and although the crowded events of the past ten days are too near to be seen in clear perspective, it is already possible to pronounce the meeting as a whole to have been an immense success. We can congratulate those immediately responsible for the organisation upon the result of their labours, and this with no stint of praise, and with full knowledge that we are giving expression to sentiments universally held. The number of members who have attended the Congress from every part of the civilised world surpasses all previous records, and we believe that the welcome given them by the British medical profession, as well as by the State, the City of London, and many private hosts, has been worthy of the occasion. All that public and private hospitality could do for the entertainment of our visitors was done, and we are confident that the International Medical Congress of 1913 will long be remembered with pleasure by guests and hosts alike. A certain scantiness in attendance at some of the sectional debates may have suggested to severe spirits that the element of social pleasure was being over-cultivated, but the social side of an international medical meeting is, indeed, very important. One of the chief aims of an International Medical Congress is to strengthen the bonds of fellowship between the members of the medical profession in different countries and to demonstrate to the world the unity of medicine in its methods and in its ideals. Mainly this is done by the constitution of a sort of scientific parliament of the nations, but the social intercommunion of the members of such a parliament helps greatly in a mutual comprehension of aims and attitudes. That the London Congress has been a gay one socially enables us to forecast with greater certainty that its outcome will be solidly valuable.

We make no attempt at an appreciation of the worth of the scientific work accomplished. It is obviously too early yet to say how much has been gained or in what respects medical thought and practice have been stimulated or reshaped by the multitudinous papers and discussions. But it is safe to assume that our general knowledge and efficiency have been advanced all along the line through this great interchange of ideas and experience among representative workers of different races. An interesting Medical Museum in connexion with the Congress, and the magnificent Museum of the History of Medicine organised by Mr. H. S. WELLCOME, gave chances for personal discussion of which eager advantage was taken, while a vast exhibition of surgical appliances, drugs, and special foods was visited by steady crowds of medical men seeking practical information. From the necessarily condensed accounts of the sectional meetings which we begin to report this week, it is evident that the range of scientific subjects dealt with has been enormous. Since the Congress was last held in London 32 years ago the territory of medicine has been widened, and provinces have been added in every direction. For the time being it may seem that as a consequence specialisation has increased regrettably, but a wiser way to regard the situation is to hope that a strong general government will be established over all recent annexations. The sections grow more numerous, but the fact comes out that definite partitions between different branches of practice do not exist, and this has been well illustrated at the recent Congress by a number of profitable joint discussions between more or less allied sections. This is a departure of the happiest omen, being a visible sign of that simplification of therapy advocated in the addresses before the Congress of Professor CHAUFFARD and Professor CUSHING. Time alone can help us to gauge the relative importance of the work done in the various departments of medicine, but it seems likely that some of the practical conclusions arrived at in these joint sessions will come to be classed among the most valuable legacies of the gathering.

Two important pronouncements, echoed and re-echoed through the sections, must be mentioned here. The pressing need for a State inquiry into the control of venereal disease, which was pointed out in these columns on June 28th last, has been affirmed by a joint meeting of the Sections of Forensic Medicine and of Dermatology and Syphilography with immediate results; while at the instance of the Section of Physiology a resolution has been passed maintaining the value and importance to medicine of the experimental method of research. If the Congress had borne no other fruit than these two pronouncements all the labour spent over it would have been justified, and this fact did not escape the notice of the lay press. For a feature of the International Congress of Medicine has been the keen and detailed interest in its proceedings shown by certain of our great daily papers, especially by the *Times* and the *Morning Post*. Not only have the general addresses been substantially published and the social functions chronicled, but even the daily sittings of the sections have been reported at considerable length. The report of Professor EHRLICH'S address in the *Times* was a proof of great resource, and the publication of a long summary of sectional proceedings daily must have been the fruit of excellent organisation. The *Morning Post*, where the sectional reports have also been good, must be honourably associated with the decision of the Government to institute an inquiry into syphilis, for the publication in that paper recently of a weighty medical communication on the subject brought its importance before a lay audience with great force and exactly at the right time. The intention of lay papers to arouse the public to a better understanding of the aims and methods of modern medicine is all to the good of the medical profession. We know that sometimes danger may lie in the almost inevitable focussing of attention upon sensational side-issues, but the good outweighs the ill.

It remains to pay a definite tribute to those responsible for the success of the Seventeenth International Congress of Medicine. Without fulsomeness we cannot praise adequately the officers of the Congress for their untiring labours throughout the meeting, but our readers ought to understand that the success was really due to the preliminary work of some eighteen months. And that work was real and earnest. With everything upon so vast a scale the difficulties of central organisation were proportionately heavy, and the fact that from beginning to end no hitch occurred in any of the general arrangements speaks volumes for the care and foresight of Dr. HERRINGHAM, the very able secretary-general, and his colleagues, among whom Sir ALFRED PEARCE GOULD, chairman of the executive committee, Mr. MAKINS, the treasurer, and Dr. CLIVE RIVIERE, secretary of the reception committee, must be specially mentioned. In their splendid efforts for the success of the meeting the executive officers had the constant support of the President, Sir THOMAS BARLOW, who, as all who knew him had foretold would be the case, proved himself to be a veritable head of the Congress, and whose simple and outspoken style of oratory, where always the meaning and not the phrase had been studied, won great appreciation. In bidding farewell to our medical brethren from every corner of the world who have honoured this country by their presence in such large numbers during the past fortnight, we may congratulate them upon taking part in one of the most interesting and important scientific gatherings that has ever been held.

International Medical Congress: The Address in Pathology.

THE study of medicine not so long ago seemed to be at the least uninteresting, if not repugnant, to the general intelligence. It is quite clear that this spirit no longer prevails, and that the public is now alive to the fact that there is much in the science of healing which is of the greatest interest to all, quite apart from sociological questions of public health, of quarantine, or of medical service in navies or armies. No one who reads the Address in Pathology, which was delivered in general session of the Congress by Professor EHRLICH on Friday in last week, can fail to understand why the problems of our science have of late become so fascinating to all intelligent men, for in his exposition of chemotherapy he told a tale replete with romance. Indeed, many would say that never before has so marvellous a tale been told as the record of the modern methods of devising and using medicines; certainly no one has ever before given so excellent an account of the way in which our latest remedies act against those microscopic foes which threaten the life and health alike of men and animals. "Interesting as a novel" is a common expression, but there are few novels possessing episodes and situations as exciting as those developed in Professor EHRLICH'S narrative. If we put aside the idea that we are dealing with questions of actual life and death, with potentialities of salvation and destruction in all sorts and degree, and regard the story as a romance of the sensational school, we feel that we are listening to a tale full of wonders; and all of us are similarly affected, whether we have studied medicine or not, if we have sufficient technological equipment. But when we appreciate that the message of that tale is to announce that of late there has been put into medical hands a weapon—nay, more, a whole armoury of weapons—which may go far to free the world from many of the worst diseases which now enthral us, we can only confess that the tale cannot be surpassed in interest and excitement by any that could be told.

The basis of the new medicine has been the recognition, or at least the partial recognition, alike of the way in which the infective diseases work us harm and of the way in which the unaided body strives to combat the attack. The connexion of many infectious maladies with the presence of germs was obvious, but frank allowance had to be made for the fact that not in all such diseases had we succeeded in seeing the actual micro-organism which was at the root of the trouble, while the natural history of the different occurrences had huge gaps. We knew, for example, that in many of these diseases one attack conferred an almost perfect immunity against subsequent attacks, but we knew nothing as to the way in which this immunity was won, and we knew that in nearly every case the use of drugs was able to do little or nothing to cut short the natural course of these often common maladies. One definite step had been made in the control of such infectious conditions: the discovery of the efficacy of vaccination had enabled us to confine within very narrow limits the field of action of small-pox. If vaccination had been rightly used it is probable that by this time the disease would have entirely disappeared from our midst or would have shown only by occasional attacks in connexion with immigrants that imported cases alone could exist here. But nobody now denies that while we were employing vaccination with the greatest practical success we were as yet uninformed as to the precise mode of action of this prophylactic; the method, efficacious though it had proved, was empirical. Gradually we have come to learn something of the complex method by which the animal body defends itself against the assaults of micro-organisms; and our knowledge, incomplete though it may be, has enabled us to devise methods of aiding the efforts of the body to get rid of the invading germs. Gradually we have learned, and for this knowledge we are in great part indebted to Professor EHRLICH, that both the tissues of the body and the bodies of bacteria and other disease-causing organisms are vulnerable because they possess particular points of attack. Professor EHRLICH'S famous side chain theory, theory though it be, explains in a comprehensive manner what may happen. The assumption that protoplasm is composed of complex molecules, bearing on them atomic groups of such instability that they are ready to combine with other atomic groups for various chemical functions, has indicated to pathologists the line along which the attack on the specific germs may be most effectively conducted. Every chemical substance cannot equally affect all germs; every antiseptic has its own peculiar property of destroying micro-organisms, and this special power will depend on its ability to link itself with what Professor EHRLICH has termed "the side chains."

This "parasitotropic" power varies enormously with different substances for any particular germ; but our selection of remedial agents is limited by the necessity of choosing only those which at the same time are the least harmful to the tissues of the host. Here the art of the modern chemical investigator has come to the assistance of the therapist. A host of substances have been placed at his disposal, and they can be tried in every way on the special germ. Thus it has come to pass that we possess salvarsan and neosalvarsan, which have done so much to place syphilis under our control. A difficulty, however, must be remembered. Not only can the human body develop substances within itself to protect itself against infective germs, but the germs can protect themselves against the remedies which have been administered to destroy them, a circumstance which serves to account for the fact that quinine sometimes loses its power over the course of malaria. But Professor EHRLICH has brought forward evidence which suggests that there are several different kinds of side chains in each micro-parasite, and when the germ has become resistant to one drug it is still vulnerable to another; indeed, he has shown that the administration of the second drug may deprive the germ of its power of resistance against the first drug. Again, under his indefatigable industry and ingenuity it has come to light that in closely allied micro-organisms the side chains are often very much alike, so that a substance which has been devised for the destruction of one germ is generally of use in the treatment of other germs of an allied nature. Salvarsan was introduced into therapeutics solely for the treatment of syphilis, but it has proved to be efficacious in the treatment of frambœsia or yaws; in fact, so great is its power that in Surinam a hospital containing 300 beds for frambœsia has been diverted from its original use because a single dose of salvarsan suffices to cure a case of frambœsia, and the supply of patients has failed.

In one other way has the study of the side chain theory already rendered aid in the treatment of disease. As there are several forms of side chains in the parasite, each of which is suited for the action of a different drug, it will follow that we can obtain a satisfactory action by the administration of a comparatively small dose of several drugs rather than by the full dose of one drug, and at the same time the harmful effect on the body of the host is lessened. And now a wonderful result is found to follow—the sum of the actions of these several small doses of different drugs is greater than a full dose of any one of them, so that there may be found to be a reason, or at least an excuse, for the polypharmacy of the Middle Ages. The new science of treatment has done much, and yet those who know most of the matter cannot but feel that we are as yet only at the beginning of the subject. If we have learned so much in the few years in which the matter has been studied, what is the prospect of the future? An almost boundless field of possibilities is opening before us. The powers of treatment will be still more enhanced, and many diseases at present beyond our control will become amenable to the action of drugs. Is it too much to hope that in their turn tuberculosis and cancer will become controllable? The great increase in the number of workers multiplies the possibilities; every civilised country is sending its quota of soldiers to join the ranks in this war against disease, and the result of the conflict cannot remain in doubt.

The Modern Study of Genetics.

THE address delivered at the International Medical Congress by Professor WILLIAM BATESON on the subject of Heredity will be found published in full elsewhere in this issue of THE LANCET. With such a subject before him it was natural that Professor BATESON should attempt only to give a bird's-eye view of the interesting position which we have reached to-day, but he added some valuable indications as to the far-reaching directions in which the studies, comprehensively described under the title of Heredity, are being carried on. To do more would have been impossible for anyone who knew, as well as the orator knew it, the enormous amount of work now being done by independent research or in laboratories—work of biological, pathological, and mathematical nature, and bearing directly upon heredity or indirectly throwing light upon its problems.

To the minds of medical men the influence of heredity has been present always—so present, indeed, that not long ago it was considered sufficient in many diseases, when allocating their causes, to allude to a defaulting ancestry and make no further ætiological investigation. But of recent years a more scientific spirit of inquiry into the influences of descent has sprung up with the development of the pursuit of eugenics. A school has arisen which is attempting to place the whole subject of birth influence, physiologically considered, upon a firmer basis. Sir FRANCIS GALTON long ago foresaw that those aspects of physiology which had a bearing upon the study of heredity must soon become a chief pre-occupation for many reflective minds, and this is what has now come about. The aim of eugenics, as laid down by GALTON, was to bring multifarious influences to bear upon the community that should induce them to contribute to the advancement of the next generation, and it is obvious that the dissemination of a knowledge of the laws of heredity would be a most practical method of attaining this object. A consideration of such facts with regard to descent in animal and plant life as could be substantiated convinced the earlier workers in eugenics that traces of order were present in the principles of heredity which had hitherto been unsuspected; it was perceived that certain processes were likely to be followed by certain results, although in the beginning neither GALTON nor his immediate followers could go further. The resurrection of MENDEL'S discoveries came exactly at this critical moment. Professor BATESON, whose work as professor of biology at Cambridge was marked by great independence of thought, became a stalwart exponent of the Mendelian doctrines, with the result which is indicated in his address, when he says that the rediscovery of the work of the Abbot of Brünn showed that the apparently capricious order of the phenomena of descent were capable in certain ways and certain directions of simple analysis. By the application of MENDEL'S principles of heredity it now appears that the speculations of both the systematised and speculative biologists are found to need revision in the light of new

facts, and these are being revealed by labours carried on in accordance with Mendelian lines. In that work of exploration all classes of naturalists will alike find interest. The methods are definite and exact, so that we need not fear the alienation of those systematists to whom all theoretical inquiry is repulsive. They are also wide in their scope and give opportunities for the stock-breeder and the gardener to coöperate with the biologist and the medical or veterinary expert in the pursuit of truth. No matter is as yet too trivial for attention, and workers may engage in genetic inquiries with the feeling that every fragment of solid evidence which they discover may take its place in the development of a coördinated structure.

The essence of the Mendelian principles is, in short, that the study of heredity can be undertaken upon a definite scientific basis as a branch of biology. The pursuit of these principles is no denial of the work of DARWIN, as we have before and more than once had occasion to point out, while it is to our minds certain that if MENDEL'S work had fallen into the hands of DARWIN—as it might easily have done—the history of the development of evolutionary philosophy would have been very different, for it is certain that DARWIN would have admitted the presence of variations occurring as discontinuous phenomena. We welcome the definite association of modern medicine with the latest researches in genetics which is implied by the delivery in general assembly of an International Medical Congress of an address on Heredity. The study of the problems of descent will illuminate for the surgeon and physician of to-day many dark places, while at any moment it may furnish magnificent opportunities for improving the future of the race.

Annotations.

"Ne quid nimis."

THE LEIPZIGER VERBAND.

THE energetic medical union known as the "Leipziger Verband," to which allusion has been made on several occasions in these columns, lately held a meeting in Elberfeld in connexion with the general practitioners' association, called in German the Deutscher Aerzte-Vereinsbund. The secretary reported that the number of members was 25,184. There are about 35,000 medical men in Germany, this number including civilians in the Government service, medical officers of the army and navy, and those who for various reasons are not in private practice, some having retired and others being engaged in scientific research or in the duties of an appointment. It may therefore be said that nearly all the medical men engaged in club practice belong to this union, which has 129 local branches and conducts correspondence on so extensive a scale that last year no fewer than 400,000 letters were received and written by its official staff. The union has lately concluded arrangements with the post-office and with the association of German steamship companies according to which only members of the union are eligible for appointments on board the vessels of the association. At the meeting there were discussions on the system adopted on the Prussian State railways where the free-choice system is objected to, and on the new insurance institution for clerks in which only Government medical officers are allowed to give certificates. The position of the medical profession with regard to philanthropic societies was discussed, as was coöperation of the profession with institutions insuring their policy-holders against accidents under the Workmen's Insurance Act, and the question of foreigners practising medicine in Germany. Representatives of the Medical Society of Kissingen suggested that the meeting should petition the Government to prohibit foreign medical men from practising without a German diploma, while allowing those to practise who are natives of countries where German medical men are allowed to practise without passing the professional examinations of the countries in question. The motion was agreed to.

JULY AT HOME AND ABROAD.

THE weather of July, contrary to the general rule, was finer and drier in the west than in the south-east and east of England, but in no part of the kingdom was the month as a whole very warm. The general level of the thermometer was kept rather low by a flow of air from the north-east, north, or north-west, and although maximum readings above 70° were not very uncommon, the figure of 80° was seldom recorded. Rain was frequent over the east and south-east until rather late in the month, but then the droughty conditions previously general in the west extended to the most eastern districts also. In the metropolitan area, at Kew, the mean maximum temperature was no higher than 66½° and the mean minimum as low as 52½°, the respective figures being 4° and 1½° below the average. At Bath and Nottingham, where the mean maximum was 65½°, there was also a defect of 4°, while the mean minimum—51° at both places—was 1° or 2° below the normal. Further north, at Buxton and Harrogate, the mean maximum temperature was only about 62½° and the mean minima 48° and 49° respectively, the divergence from the average being about the same as in London. On the south coast of Devon and at Bournemouth the day temperature was higher than in London—a very unusual feature for July. Torquay had a mean maximum temperature of 67½° and Bournemouth 68½°. At night, however, the Devonshire resort was warmer than Bournemouth, the mean minimum at Torquay being rather above 55°, or 2½° higher than that at Bournemouth. Along the north coast of Cornwall the wind, coming from the sea, prevented great warmth, and the mean maximum temperature at Newquay was only 62½°. Brighton was a degree cooler than London during the day and a degree warmer at night, while at Jersey both the mean maximum and mean minimum were practically the same as at Torquay. The supply of sunshine was generally very meagre, especially in the east and south-east. While an average July gives 204 hours to Kew, last month could manage no more than 108 hours, a deficiency of nearly 3½ hours per day. In some other localities the deficiency was even greater, amounting at Nottingham to 114 hours, the total number of hours recorded being only 76. In the south-west of England, in spite of the absence of rain, there was much cloud. At Torquay the total sunshine, 197 hours, was 51 hours below the normal, although it was 55 hours above the beggarly figure of July, 1912. At Newquay there were 203 hours, and at Jersey 197 hours, the latter figure showing a deficit of 54 hours. Over the greater portion of the west and south-west the weather was in a droughty condition throughout, and even in the south-east and east the total rainfall was generally less than usual in spite of the frequent falls until after the 20th. Kew had no rain after the 22nd, but previously rain had fallen on 14 days, yielding altogether 1·9 in., against an average of 2·3 in. Brighton was one of the very few spots with an excess of rainfall, its total being

3·5 in., or 1·4 in. more than the normal. At Torquay, where an average July yields 2·3 in., there was only 0·3 in.; at Bath, 0·4 in.; Jersey, 0·5 in.; and at Newquay, 0·7 in. At Harrogate and Buxton the deficit was 1·8 in. and 2·6 in. respectively. From an agricultural point of view the effects of the droughty conditions would have been more serious if the temperature and sunshine had been equal to the average, and evaporation consequently more active. As in this country, the weather on the continent was rarely very hot. Maximum temperature readings above 80° occurred much less frequently than ordinarily at Paris, Brussels, and Berlin, and not once was the thermometer so high as 85°. Both at Paris and Berlin the mean maximum temperature was 70½°, the mean minimum at Paris being 53½°, and that at Berlin a degree higher. Brussels was less warm than Kew, both during the day and night, but the difference was very slight, especially during the daytime. The rainfall was generally more frequent and also heavier than in this country. At Brussels, where 16 days brought more or less rain (0·04 in. or more), the aggregate was as much as 3·8 in.; at Paris, where rain fell on 11 days, the total was 2·8 in.; and at Berlin, where there were only eight rain days, 1·9 in. Sunshine was in default except rather late in the month. At Paris there was less than in the south-west of England, the figure being only 163 hours. Switzerland and the Jura region of France experienced considerable spells of fine, moderately hot weather, interrupted by an occasional few days of rain and local thunderstorms, and in Italy the month differed little from an average July, very little rain falling, and the temperature rising to about 90° over the inland districts and to several degrees above 80 on the coast.

AN IRISH-AMERICAN TALISMAN.

SELDOM has it been possible to trace the origin of a talisman endowed with supposed medicinal virtues. It is said, however, on good authority, that the Irish poor of Chicago are, or have lately been, handing about among themselves a charm, in the shape of a large oblong rock crystal, which presumably cures diseases and of which the history is at least partly known. This history was told recently in the rooms of the Royal Irish Academy in Dublin, where a priceless collection of some 30 ancient Irish MSS. are stored in a safe among the books which once constituted the library of Thomas Moore, the poet. The crystal in request among the Irish of Chicago was prized out of its sockets in the lid of a shrine or casket containing one of these MSS. This was "The War-Book of the O'Donnels," and the shrine enclosing it is a beautiful fourteenth century box, with embossed figures of saints and large crystals of a pinkish hue, caused probably by a substratum of colour underneath the stones themselves. This casket was anciently chained to the breast-plate of the Bard of the O'Donnels, who carried it in battle. The book, an honoured literary record of the history and pedigrees of the O'Donnels, was inside the casket, and remained there until the vandalistic "forties" of the nineteenth century, when the then O'Donnel turned the shrine into a glove-box, which he kept on his hall table. A nursemaid in his house, seeing the dishonour into which this venerable Celtic relic had fallen, took advantage of the fact that one of the brilliants in the cover was loose to prize it out and present it to her young man, who emigrated. Of recent years a communication reached the present head of the clan or sept to the effect that a dying penitent had confessed that he possessed the talisman and knew its origin. It was suggested that the charm would be returned on receipt of a cheque for a substantial amount, as the holders of the crystal were very poor. The cheque, however, was not sent, as the stone was considered not worth it. The talisman is still at large, and the Irish poor of Chicago doubtless continue to effect supposed cures with it. Stones and crystals capable of effecting cures are often cherished in the Northern Highlands of Scotland, but their histories are not as definitely traceable as this one. At the time of the Highland Exhibition in Edinburgh some five or six years ago many of these stones were lent by the clans and exhibited, and an account of them was published by the *British Medical Journal*. Medicinal stones are known to all primitive peoples. They are mentioned in the Prose Edda, and in the shape of fossil sea-urchins were greatly prized by the ancients, who bought them from the Druids of Gaul. Akin to these are the "bezoar stones" of the Middle Ages and the porous snake-stones of Dutch South Africa, which, when applied to a snake-bite, suck up the venom and drop from the wound when replete. Many English practitioners in remote countrysides, such as may be found in Somersetshire or Cumberland, could tell of similar relics of stone worship.

CANCER IN RELATION TO FUEL.

A SOMEWHAT novel relationship has been suggested by Mr. C. E. Green, F.R.S.E., in two recent communications to the *Edinburgh Medical Journal* between the local incidence of cancer and the nature of the fuel consumed in the houses of the inhabitants. The author's first investigation on this subject dealt with the local prevalence of the disease in the county of Nairnshire, in which the death-rate is notably high. It transpired that the incidence of cancer was apparently limited strictly to those districts of the county in which coal was consumed as fuel and that only one death from this affection had been observed within ten years in the other portion of the district in which peat was the only substance burnt. A further series of researches were next undertaken into the cancer mortality of the county of Orkney, an area made up of a large number of islands in some of which peat alone is used as fuel, in others coal. In the whole district the deaths from cancer form 1 in 14 of the total number of deaths; but while in some islands the cancer rate is 1 in every 7 of all deaths, in others it is only 1 in 27 or 28, and in Stenness it is 1 in 42. At first sight the relationship of the disease to the consumption of coal was well borne out, islands with a low relative mortality being found to be peat-consuming districts, while those with a high percentage were users of coal. Notable exceptions to the rule were, however, forthcoming in three districts showing high rates, in which peat was the usual form of fuel, and further investigation was therefore directed to the quality of this material in the different parts. A very striking divergence in this was at once apparent, for examination of samples of peat from these areas revealed the fact that the substance there obtainable was very different from that used in the cancer-free districts of Nairnshire first investigated. In the cancerous areas the peat used was found to be a hard blackish substance which crackled like coal and gave out long blue flames, unlike the soft smouldering qualities of ordinary peat. Chemical analysis also proved of great interest, as while peat from districts where there is practically no cancer was found to have a sulphur-content varying between 0·101 and 0·189 per cent., that from districts in which there was a low cancer mortality contained about 0·237 per cent. of this element, and that from cancerous districts showed amounts varying from 0·676 to 0·890 per cent. These results are very remarkable, forming a noteworthy instance of an exception which is finally seen to confirm rather than invalidate a rule. It would seem from Mr. Green's researches that there is a direct relationship between the sulphur-content of the fuel consumed

and the mortality from cancer in the districts investigated. He attributes the ill-effects to the action of sulphur dioxide formed in the process of combustion, and notes an analogy between this and the formation of tumours on the roots of plants owing to the use of vitriolated manures. Whether sulphur be the true agent or not, we have before us one more piece of evidence tending to connect the incidence of malignant disease with the action of chemical irritants—a discovery which may be set beside Mr. H. C. Ross's work on the appearance of epithelioma in tar-workers and the well-known clinical observations on the frequency of intrathoracic neoplasms in cobalt miners and of scrotal epithelioma in chimney sweeps.

THE NATIONALITY OF ST. LUKE.

NOT only intensively, but extensively, the topics taken up and dealt with at the recent International Congress of Medicine have shown a marked development over preceding Congresses. Discussion has gone deeper and covered a wider area than on any previous occasion of the kind. Medical history, well-nigh for the first time, has received the consideration due to its inherent interest and to the accessions made to its subject-matter—prominent among these being the fresh light thrown on that fascinating personality the "beloved physician" and *bon camarade* of St. Paul, the author, moreover, of what Ernest Renan has pronounced the loveliest book ever written. A ship's surgeon in the mercantile marine of the Levant, and a Greek by nationality, who, in the practice of his profession, became friend and secretary of the Apostle of the Gentiles, in which capacity he bequeathed to Christendom the equally picturesque and historically valuable book of the "Acts"—such has hitherto been the received impression of St. Luke—an impression rather confirmed than materially modified by recent criticism. But now in the Historical Section of the Medical Congress, in which (Dr. Norman Moore worthily presiding) many ably compiled papers were read, Miss Melian Stawell, who shares with Miss Jane Harrison a claim to authority on Hellenic life and literature, comes forward with a new theory of the evangelist's nationality and *motif*—to wit, that he was a Roman and not a Greek, and that, as such, he was so impressed by the Æneas legend as sung by Virgil that he gives to the voyages of his hero something of the character of those of Æneas, the "determination" of both being to Rome, the haven and the ultimate seat of earthly authority, whence, as from a "coign of vantage," the mission of the Jew, as of the Trojan, might have its ecumenical diffusion. Miss Stawell propounds and defends this very striking thesis with the learning and the ingenuity she has accustomed us to expect from her, and anticipates objections to it with a fulness of detail that attests the care with which she has thought it out. Luke, she maintains, was no more a practising physician by profession than was his great contemporary in the healing art, Celsus, who, as a Roman patrician, owned a large number of slaves whose health and efficiency were duly attended to in the *valetudinaria* (or private hospitals) which were attached to every nobleman's estate. Like Celsus, he had mastered the Greek authorities in medicine, and while closely reflecting their nomenclature, and even phraseology (as elaborately shown in Dr. Hobart's monograph), he writes Greek as a Roman would do, who, consciously or unconsciously, gives it a Latin flavour. His very name, as indeed is universally admitted, is not Greek but Roman, and Miss Stawell thinks it not improbable that he belonged to the great *gens Annaea*, the patrician house of Spain, to which Seneca, Gallio, and the poet Lucan all belonged. On this hypothesis she sees the explanation of Luke's being left at liberty in Rome when his friend Paul was under surveillance; also why he knew so much as to Gallio's temperament, and why there is so marked a correspondence between the occasional Christian inspiration of Seneca and the Gospel. Conscious of being a "Civis Romanus" in even a stricter sense than Paul, Luke, according to Miss Stawell, in his pride of Roman citizenship and his homage to Cæsar, draws on Virgil's religious epic, which must have been even more familiar to him than it was to Dante, for the *motif* which, as it determined the Romeward voyage of Æneas, so it directed that of Paul, both being able to feel—

> Per varios casus, per tot discrimina rerum
> Tendimus in Latium.

In support of which view Miss Stawell finds, in the seafaring vicissitudes of both, correspondence as to "signs and symbols" which proves the dominating force in Luke's narrative of the Virgilian poem, and, while perfectly faithful in his narrative of voyage and shipwreck, inspires him to an insistence on detail which, but for that inspiration, would have been less vividly in evidence. Her whole theory, illustrated with many an apt coincidence, has this to be said in its support, that it fits in admirably with the suggestion of that great master of the "higher criticism," Professor Harnack, of Berlin—to wit, that the fundamental theme of "Acts" is "the travelling of the Gospel under the guidance of the Holy Ghost from Jerusalem to Rome." Biblical students may not (indeed, will not) in every case see eye to eye with Miss Stawell in her new reading of St. Luke's personality, career, and narrative, but none will withhold from her the praise of independence, nay originality, of view and of a scholarship as wide as it is well-grounded and deep.

THE PROPHYLAXIS OF CHOLERA BY INOCULATION.

THE prophylaxis of certain dangerous diseases by means of inoculation of vaccines is now generally recognised as being based on scientific principles and in practice yielding valuable results. Hitherto circumstances have been unfavourable to the adoption of this method for the prevention of cholera. It may be remembered that unsuccessful attempts by this means were made by Ferran in 1885 to check the ravages of this malady in Spain, and these results, for a time at least, discouraged the prosecution of research work on anti-cholera inoculation. But Ferran's procedures can hardly be regarded as similar to those now advocated, for he used "live" material obtained from patients suffering from cholera attacks of a mild type. His method may therefore be classed with a "variolisation" rather than with a vaccination. Naturally, in a country like India, where cholera is seldom absent for any length of time, the question of the prophylaxis of the disease has excited considerable interest. Some 20 years ago, or more, the subject of prophylactic inoculation against cholera began to receive careful attention, particularly by Haffkine, but the serious outbreak of plague in 1896 and its continuation in India from that time up to the present in serious epidemic form, put a stop to the investigations on anti-cholera vaccines, and it is only recently that the last-named investigator has been able to resume his researches. Haffkine has lately published a memoir on "Protective Inoculation against Cholera,"[1] and in it, while giving an epitome of previous investigations by other workers, he makes reference to recent official correspondence regarding vaccination against cholera and the study and preparation of a devitalised form of anti-cholera vaccines. In this connexion he draws attention to the support which

[1] Protective Inoculation against Cholera. By W. M. Haffkine, Bacteriologist with the Government of India. Calcutta: Thacker, Spink, and Co. 1913. Pp. 98. Price 3 rupees, or 4s. 6d. net.

his own views have received from the work done by other investigators. In his memoir are discussed the preparation of the vaccine, immunisation of man against cholera, and anti-cholera vaccine after its devitalisation. It is very desirable that an investigation, conducted in India during actual outbreaks of the disease under conditions of accurate scientific research as indicated by Haffkine, should be carried out at an early opportunity, especially in view of the advantages which a devitalised prophylactic is said to offer in practical application. Haffkine states that just as it is important to obtain first a positive result on the question of cholera immunisation in general and to use in investigating that matter the most reliable vaccine, so it is important to avoid in the beginning the possibility of failure in the study of the vaccine in a devitalised form. For this reason it is preferable at present to use the devitalised vaccine in its entirety rather than extractions or other derivatives of it. Two forms of this vaccine commend themselves to Haffkine—viz., (1) the first prepared by prolonged cultivation in a fluid medium and devitalised by heat and carbolic acid; and (2) one prepared by cultivation on a solid medium and devitalised, as soon as developed, by a solution of the same antiseptic compound. A study of the protection derived from the employment, separately, of these two forms of vaccine, in various doses, should, in Haffkine's opinion, afford information as to the direction in which the plan will have to be modified for further study.

ANÆSTHESIA BY INTRATRACHEAL INSUFFLATION.

ONE of the most interesting subjects dealt with in the Anæsthesia Subsection of the International Congress of Medicine is intratracheal insufflation. Some ten years ago attempts were made by Tuffier, and later by Kuhn and Lotsch, to fulfil the double object of producing *plus* pressure in the thorax as well as anæsthesia by intubation of the larynx. However, no precise knowledge came to us concerning the possibilities of using an intratracheal method for etherisation until Dr. S. J. Meltzer, of the Rockefeller Institute, New York, undertook his brilliant research upon the subject. Although the intratracheal route rendered possible by catheterisation of the trachea was adopted originally to enable the surgeon to perform operations upon the thoracic viscera, the pulmonary air being maintained at a *plus* pressure, the method has since proved to have a far wider application. The reduction of the pulmonary excursion to a minimum renders abdominal as well as other operations at once easier and capable of wider extension. Dr. Meltzer has shown that after catheterisation of the trachea the reflex current of air from the lungs is sufficiently powerful completely to prevent fluids or particulate matter passing from the buccal or pharyngeal spaces down into the lungs. The experiments made in which carbon particles were introduced into the mouth, or in which the animal was induced to vomit while intratracheal insufflation was practised, all proved that no matter gained access to the trachea around or through the tracheal catheter. The gain of this to the surgeon who has to undertake a grave operation upon the tongue, jaws, or for malignant growths invading the tonsil and pharyngeal wall is obvious. Although the procedure is simple to one familiar with its technique, it requires special apparatus and a thorough knowledge of the principles which Dr. Meltzer has shown to underlie the method. Indeed, some surgeons who are interested in thoracic operations have suggested that since *plus* pressure obtained by the intratracheal method of etherisation is usually broken at definite intervals to enable the pulmonary circulation to continue, the plan is open to objection. Now, as a matter of fact, Dr. Meltzer's experiment expressly indicates that no complete break in *plus* pressure is necessary. If a regular interruption is arranged for, and this is easily done, all that is necessary is that whatever the maximum pressure is set, say 20 mm. Hg, it shall be made to drop at each interruption, but never to the point of actual lung collapse. Warming and sterilising the air and ether vapour which Dr. Elsberg urges when the method is used for human patients appear to be advantageous even if not absolutely essential in the physiological laboratory. It is possible to apply this method for either ether or for nitrous oxide and oxygen. Chloroform so far as Dr. Meltzer's experience goes is far too dangerous, although we believe that no thorough attempt has yet been made with definite low percentages. With those which have been used not only is there immediate danger, but tissue changes in the viscera rapidly appear, evincing the effect of chloroform toxæmia. In Dr. Meltzer's interesting report before the Anæsthesia Subsection is a description of an extremely simple apparatus which, uncomplicated as it is, yet possesses the safeguards essential to every intratracheal etheriser—viz., a mercury pressure valve and a manometer. Dr. Elsberg's original apparatus fulfils all the requirements emphasised by Dr. Meltzer, with whom he worked, but less complex systems have been devised both in the United States and in this country. There can be no doubt of the value of the method which has now been adopted for thousands of cases, and, provided due safeguards are present, the simpler the apparatus and the technique the better. This work of Dr. Meltzer provides a convincing example of the value to the technical man of the experiments performed by the pure scientist who is unshackled by professional cares and free from the *idée fixe* which often tends to keep the anæsthetist within well-worn paths.

SCHOOL MEDICAL INSPECTION IN INDIA.

THERE is, perhaps, no community throughout the British Empire more enlightened, philanthropic, and public-spirited than that of the Parsis in Bombay, whose leading members have distinguished themselves over and over again by their generous support of hospitals and schools and in relief of distress generally. The principle that the best way to deal with poverty is to endeavour to prevent its occurrence, so far as this is practicable, and similarly that the best way to deal with disease prevalence is to endeavour to check its development at the earliest moment, has now for many years been accepted and carried out in practice by most European peoples. It is, however, only a very few years since, even with ourselves, practical steps have been taken in one very obvious direction—viz., the systematic examination of school children—to discover any physical defects there may be to prevent, or to hinder, them from growing up in good health and able to earn their own livelihood. Indeed, it may be said that in the metropolis itself the task has only been undertaken with thoroughness during the past year. Our Parsi fellow-subjects are quick to apprehend these western developments, and already a Bombay physician, Dr. Dadachanji, has brought the matter before the Zoroastrian Conference in an address, entitled "Parsi Education and Parsi Health: a Plea for the Communal Care and Welfare of our Children." The Indian educational authorities have not yet, as far as we know, taken steps to carry out medical inspection of school children throughout the country. At the Madras Sanitary Conference last November the subject was introduced by Dr. Amritaraj. Major T. Stokes, I.M.S., said that medical inspection had been commenced in the municipal schools in the Central Provinces, but owing to the difficulty of obtaining medical men to perform the inspection in the districts the scheme had been abandoned. Colonel E. Wilkinson, I.M.S., said that examination of the eyes was carried out in the

schools in several Punjab towns. In Bengal there was no medical inspection at all, nor was there any in the United Provinces. It is obvious that in many parts of the country if the female children are to be inspected female medical practitioners will be required to do the work. As to the position which the Government are taking up on this question, or whether they are considering the matter at all, we have no information. *Festina lente* is a sound principle to act upon, and the work is too vast to be undertaken lightly. Probably a beginning will be made in the large towns.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In the 96 English and Welsh towns, with populations exceeding 50,000 persons at the last Census, and whose aggregate population at the middle of this year is estimated at 17,852,766 persons, 8887 births and 3957 deaths were registered during the week ended Saturday, August 2nd. The annual rate of mortality in these towns, which had been 11·4, 11·3, and 11·0 per 1000 in the three preceding weeks, rose to 11·6 per 1000 in the week under notice. During the first five weeks of the current quarter the mean annual death-rate in these towns averaged 11·3, against 10·6 per 1000 in London during the same period. Among the several towns the death-rate in the week under notice ranged from 3·0 in Hornsey, 5·7 in Gillingham, 5·8 in Dewsbury, 5·9 in East Ham and in Southend-on-Sea, and 6·1 in Enfield, to 16·9 in Middlesbrough, 17·3 in Wallsall, 18·7 in Barnsley, 19·2 in Dudley, and 20·0 in Stoke-on-Trent.

The 3957 deaths from all causes in the 96 towns were 183 in excess of the number in the previous week, and included 448 which were referred to the principal epidemic diseases, against 343 and 394 in the two preceding weeks. Of these 448 deaths, 264 resulted from infantile diarrhœal diseases, 77 from measles, 47 from whooping-cough, 36 from diphtheria, 18 from scarlet fever, and 6 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases was equal to 1·3, against 1·0 and 1·2 per 1000 in the two preceding weeks. The deaths of infants (under 2 years of age) attributed to diarrhœa and enteritis, which had been 155, 149, and 214 in the three preceding weeks, further rose to 264, and included 48 in London, 26 in Liverpool, 19 in Sheffield, 18 in Manchester, 16 in Leeds, 12 in Birmingham, 11 in West Ham, and 10 in Birkenhead. The deaths referred to measles, which had been 69, 68, and 77 in the three preceding weeks, were again 77 in the week under review; of this number 15 were recorded in Stoke-on-Trent, 13 in London, 11 in Liverpool, 6 in Manchester, 4 in Walsall, and 4 in Salford. The fatal cases of whooping-cough, which had been 55. 62, and 50 in the three preceding weeks, further fell to 47; 15 deaths occurred in London, 4 in Liverpool, 4 in Hull, 3 in Manchester, and 3 in Leeds. The deaths attributed to diphtheria, which had been 34, 35, and 31 in the three preceding weeks, rose to 36, and included 6 in Birmingham, 5 in London, 4 in Stoke-on-Trent, 2 in Birkenhead, and 2 in Liverpool. The deaths referred to scarlet fever, which had been 17, 20, and 15 in the three preceding weeks, were 18, of which number 5 were registered in London, 4 in Sheffield, and 3 in Birmingham. Six fatal cases of enteric fever were recorded, against 14, 9, and 7 in the three preceding weeks.

The number of scarlet fever patients under treatment in the Metropolitan Asylums and the London Fever Hospitals, which had steadily risen from 1418 to 2100 at the end of the seven preceding weeks, had further risen to 2125 on Saturday, August 2nd; 258 new cases were admitted during the week, against 315, 357, and 346 in the three preceding weeks. These hospitals also contained on August 2nd 891 cases of diphtheria, 274 of measles, 245 of whooping-cough, and 52 of enteric fever, but not one of small-pox. The 898 deaths from all causes in London were 20 fewer than the number in the previous week, and corresponded to an annual death-rate of 10·4 per 1000. The deaths referred to diseases of the respiratory system, which had been 137, 115, and 107 in the three preceding weeks, were 108, and were 3 above the number recorded in the corresponding week of last year.

Of the 3957 deaths from all causes in the 96 towns, 173 resulted from various forms of violence and 350 were the subject of coroners' inquests. The causes of 27, or 0·7 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Manchester, Leeds, Bristol, West Ham, Bradford, Newcastle-on-Tyne, Nottingham, and in 76 other smaller towns. Of the 27 uncertified causes of death, 5 were registered in Birmingham, 3 each in Stoke-on-Trent, in Liverpool, in St. Helens, and in Warrington, 2 in London, and 2 in Sheffield.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns, with an aggregate population estimated at 2,259,600 persons at the middle of this year, 1144 births and 643 deaths were registered during the week ended Saturday, August 2nd. The annual rate of mortality in these towns, which had steadily declined from 14·9 to 13·1 per 1000 in the five preceding weeks, rose to 14·8 per 1000 in the week under notice. During the first five weeks of the current quarter the mean annual death-rate in these Scotch towns averaged 13·7, against 11·3 per 1000 in the 96 large English towns. Among the several towns the death-rates in the week under review ranged from 7·1 in Leith, 8·8 in Falkirk, and 8·9 in Perth, to 17·4 in Greenock, 19·9 in Ayr, and 20·3 in Hamilton.

The 643 deaths from all causes were 77 in excess of the number in the previous week, and included 61 which were referred to the principal epidemic diseases, against 61 and 64 in the two preceding weeks. Of these 61 deaths, 21 resulted from infantile diarrhœal diseases, 16 from measles, 14 from whooping-cough, 5 from scarlet fever, and 5 from diphtheria, but not one from enteric fever or from small-pox. These 61 deaths from the principal epidemic diseases corresponded to an annual death-rate of 1·4, against 1·3 per 1000 in the 96 large English towns. The deaths of infants (under 2 years of age) attributed to diarrhœa and enteritis, which had been 17, 13, and 24 in the three preceding weeks, slightly fell to 21 in the week under review, and included 12 in Glasgow, 3 in Edinburgh, and 2 in Paisley. The deaths referred to measles, which had declined from 38 to 18 in the four preceding weeks, further fell to 16, of which number 12 were recorded in Glasgow. The fatal cases of whooping-cough, which had been 16, 11, and 15 in the three preceding weeks, were 14, and included 10 in Glasgow. The 5 deaths attributed to scarlet fever were equal to the average in the earlier weeks of the quarter. Of the 5 deaths referred to diphtheria 3 were registered in Glasgow. A fatal case of typhus was also recorded in Glasgow.

The deaths referred to diseases of the respiratory system, which had been 79, 71, and 63 in the three preceding weeks, rose to 83 in the week under notice; 28 deaths resulted from different forms of violence, against 23 and 31 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the 27 town districts of Ireland, with an aggregate population estimated at 1,199,180 persons at the middle of this year, 663 births and 381 deaths were registered during the week ended Saturday, August 2nd. The annual rate of mortality in these towns, which had been 15·5, 15·2, and 16·4 per 1000 in the three preceding weeks, further rose to 16·6 in the week under notice. During the first five weeks of the current quarter the mean annual death-rate in these Irish towns averaged 16·0 per 1000; in the 96 large English towns the corresponding rate did not exceed 11·3, while in the 16 Scotch towns it was equal to 13·7 per 1000. The annual death-rate in the week under review was equal to 17·3 in Dublin (against 10·4 in London and 16·2 in Glasgow), 15·9 in Belfast, 25·8 in Cork, 19·1 in Londonderry, 8·1 in Limerick, and 22·8 in Waterford, while in the remaining 21 smaller towns the mean death-rate did not exceed 13·2 per 1000.

The 381 deaths from all causes were 3 in excess of the number in the previous week, and included 42 which were referred to the principal epidemic diseases, against 28 and 27 in the two preceding weeks. Of these 42 deaths, 28 resulted from infantile diarrhœal diseases, 8 from measles,

2 from scarlet fever, 2 from whooping-cough, 1 from enteric fever, and 1 from diphtheria, but not one from small-pox. The mean annual death-rate from these diseases was equal to 1·8 per 1000; in the 96 large English towns the corresponding rate did not exceed 1·3, and in the 16 Scotch towns 1·4 per 1000. The deaths of infants (under 2 years of age) attributed to diarrhœa and enteritis, which had been 15, 16, and 15 in the three precedings weeks, rose to 28 in the week under notice; of this number 13 occurred in Belfast and 11 in Dublin. The deaths referred to measles, which had been 4, 4, and 5 in the three preceding weeks, rose to 8, and comprised 4 in Londonderry, 2 in Belfast, and 2 in Waterford. The deaths from scarlet fever, from whooping-cough, and from diphtheria were registered in Belfast, and the fatal case of enteric fever in Dublin. A death from typhus was also recorded in Dublin.

The deaths referred to diseases of the respiratory system, which had been 52, 56, and 41 in the three preceding weeks, were 42 in the week under notice. Of the 381 deaths from all causes, 104, or 27 per cent., occurred in public institutions, and 13 resulted from different forms of violence. The causes of 7, or 1·8 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest; in the 96 large English towns the proportion of uncertified causes of death in the week under notice did not exceed 0·7 per cent.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

IN accordance with the provisions of Order in Council of April 1st, 1881, Fleet-Surgeon Francis Herbert Aylen Clayton has been placed on the Retired List at his own request (dated July 30th, 1913).

In accordance with the provisions of His late Majesty's Order in Council of August 11th, 1903, Surgeon Edward James Hamilton Garstin has been allowed to withdraw from His Majesty's Naval Service with a gratuity.

Surgeon John Bourdas has been advanced to the rank of Staff-Surgeon in His Majesty's Fleet (dated August 10th, 1913).

The following appointments have been notified:—Fleet-Surgeons: J. W. W. Stanton to Haslar Hospital for instruction of Acting Surgeons; L. Kilroy to the *Colossus;* W. K. Hopkins to the *Vivid*, additional, for trials of *Fearless;* E. Sutton to the *President*, additional, for London Recruiting Headquarters, temporary; J. C. Durston to the *Defence;* C. H. J. Robinson to the *Dartmouth;* and H. F. Iliewicz to the *Hercules*, all on recommissioning. G. Gibson to the *Indomitable;* H. S. Burniston to the *Warrior;* E. S. Miller to the *Antrim;* H. Spicer to the *Invincible;* and W. B. Macleod to the *Cornwallis*. Staff-Surgeons: J. Fullarton to the *Patrol*, on commissioning; J. O'Hea and A. G. Eastment, both to the *Hermes*, additional for Isle of Grain Flying Station and Calshot Flying Station respectively; S. H. Facey to the *Irresistible;* J. McA. Holmes to the *Achilles;* and W. T. Haydon to the *Vivid*, additional, for disposal. Surgeons: J. S. Ward to the *Defence* and E. P. G. Gauston to the *Hercules*, both on recommissioning; G. T. Verry to the *Vernon;* A. G. Malcolm to the *Alecto;* and A. E. Malone to the *Vivid*, additional; P. B. Egan to the *Invincible;* A. R. Price to the *Indomitable;* J. P. Berry to the *Vivid*, additional, temporary; and J. G. Danson to the *Warrior*.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel J. F. Donegan, medical officer in charge of the Royal Dockyard at Woolwich, has been placed under orders for a tour of duty with the Southern Army in India. Lieutenant-Colonel S. Glenn Allen has arrived home on leave of absence from Gibraltar. Lieutenant-Colonel A. A. Sutton, D.S.O., Commandant at the Royal Army Medical Corps Camp of Instruction at Longmoor, has been appointed to command No. 1 Clearing Hospital at the Aldershot Command Medical Manœuvres. Lieutenant-Colonel G. F. H. Marks has been transferred from Ferozepore Cantonment to Dalhousie and appointed to hold charge of the Military Hospital. Lieutenant-Colonel C. A. Stone, at present holding charge of the Military Hospital at Parkhurst, has been appointed to command No. 2 Field Ambulance at manœuvres.

Major E. A. Bourke has been transferred from the Military Hospital at Chester to Carlisle. Major J. H. Brunskill has taken up duty as Specialist Sanitary Officer to the Dublin District. Major A. R. O'Flaherty has been appointed to the Military Hospital at Kasauli on transfer from Ambala Cantonment. Major C. E. Fleming has taken up duty at the Military Hospital, Pretoria. Major J. H. R. Bond has been appointed to hold charge of the Military Hospital at Naini Tal cantonment. Major A. Chopping has been transferred from the Royal Herbert Hospital at Woolwich to the Royal Victoria Hospital at Netley and appointed Registrar. Major C. J. O'Gorman has been granted five months' leave of absence home from India on medical certificate. Major J. Matthews has been appointed to the Military Hospital at Secunderabad. Major G. W. Tate, Medical Inspector of Recruits in the Irish Command, has been placed under orders for a tour of duty in Bermuda. Major H. M. Morton has arrived home for duty from South Africa, tour expired. Major S. A. Archer has arrived home on leave of absence from the Military Hospital at Jullundur Cantonment. Major S. W. Sweetnam has been granted eight months' leave of absence home from India, with permission to revert to the Home Establishment on its completion. Major F. W. Lambelle has taken up duty at Maymyo as Specialist in Operative Surgery to the Burma Division. Major F. E. Rowan Robinson has been appointed to hold charge of the Military Hospital at St. George's, Bermuda. Major J. C. B. Statham has taken up duty as Specialist Sanitary Officer to the Sierra Leone Protectorate.

Captain G. E. Ferguson has been appointed to the Northern Command. Captain G. W. G. Hughes has been selected for appointment as Specialist in Ophthalmology to the Devonport District, in succession to Major E. E. Parkes, whose tenure of the appointment has expired. Captain D. de C. O'Grady has been transferred from Rawal Pindi to Barian. Captain V. H. Symons has been appointed to the Western Command. Captain J. E. Powell has been selected for appointment as Specialist in Dermatology and Venereal Diseases at Hilsea. Captain W. McD. MacDowall has been placed under orders for a tour of duty in Jamaica. Captain R. G. Anderson has been appointed to the Fourth-class Order of the Medjidieh by H.H. the Khedive of Egypt in recognition of valuable services. Major A. McMunn has arrived home from the Military Hospital at Hong-Kong on leave of absence. Captain J. H. Campbell has been appointed to the Scottish Command. Captain R. C. Sidgwick has been selected for appointment as Specialist in Operative Surgery at the Royal Herbert Hospital, Woolwich. Captain H. M. J. Perry has taken up duty at Devonport. Captain T. W. O. Sexton has been appointed to Woolwich. Captain W. J. E. Bell has been appointed for duty at the Queen Alexandra Hospital, Grosvenor-road, S.W. Captain J. W. Lane has been granted six months' leave of absence home from India. Captain R. C. Paris has been appointed Specialist in Dermatology and Venereal Diseases to the Fourth (Quetta) Division of the Southern Army in India. Captain A. W. Byrne has been appointed to the Central Research Institute in Kasauli. Captain W. Mitchell has been transferred from Ambala Cantonment to Subathu. Captain J. E. M. Boyd has been permitted to extend his Indian tour of service for one year further.

Lieutenant W. J. Webster has been placed under orders for a tour of duty in Malta. Lieutenant C. C. Jones has been appointed to the Queen Alexandra Military Hospital at Grovenor-road, S.W. Lieutenant E. G. S. Cane has been transferred from the Military Hospital at Poona Cantonment to Colaba, Bombay. Lieutenant C. M. Finny has left the Dublin District for service in India. Lieutenant L. Dunbar has been appointed to the Southern Command. Lieutenant J. E. Hepper has been transferred from the Military Hospital at Tidworth to Salisbury Plain and appointed to hold medical charge at Fargo Camp. Lieutenant B. H. H. Spence has been placed under orders to embark for a tour of service in India on Dec. 11th. Lieutenant T. H. Balfour has taken up duty at Fort George, on transfer from the Military Hospital at Edinburgh.

INDIAN MEDICAL SERVICE.

Lieutenant-Colonel J. G. Hojel has been selected for appointment as officiating Health Officer of the Port of Bombay, in succession to Lieutenant-Colonel J. Cummin, V.C., C.I.E., granted leave of absence. Lieutenant-Colonel

E. R. Parry, Superintendent of the Central Jail at Midapore, has been appointed to hold charge of the duties of Civil Surgeon to the Midapore District. Lieutenant-Colonel R. H. Castor has been granted six months' extension of his leave of absence home from India on medical certificate. Lieutenant-Colonel P. B. Haig, agency surgeon to the Bhopal State, has been awarded the Kaisar-i-Hind gold medal for distinguished services.

Major V. H. Roberts has been appointed Civil Surgeon to the Chhindwara District. Major A. G. McKendrick has been granted leave of absence combined with furlough home from India for two years. Major W. V. Coppinger has been selected for appointment as Civil Surgeon at Dibrugarh, Assam, in succession to Major A. Leventon. Major H. R. Nutt has been confirmed in his apointment as Second Class Civil Surgeon by the Government of India, in succession to Lieutenant-Colonel J. M. Caddell, retired. Major H. J. Walton has been granted privilege leave of absence for two months and 25 days. Major H. M. Cruddas has arrived home on leave of absence from India. Major P. St. C. More has been appointed Civil Surgeon at Sialkot.

Captain A. G. Presidder has been selected for appointment as Medical Officer to the 87th Regiment of Punjabis. Captain H. E. Stranger Leathes has been granted eight months' leave of absence home from India. Captain A. W. Howlett, officiating civil surgeon at Mussooree, has been transferred to Bareilly and appointed to officiate as Superintendent of the Central Prison, in succession to Captain W. P. G. Williams. Captain E. T. Harris has been transferred from Mogok to Bassein and appointed Civil Surgeon. Captain J. L. C. Little has been granted an extension of his leave of absence home from India for a further six months on medical certificate. The services of Captain W. L. Forsyth have been placed at the disposal of the Government of Madras Presidency for employment in the Jail Department. Captain W. T. Finlayson, Superintendent of the Borstal Central Jail at Lahore, has been granted two years' furlough. The services of Captain C. H. Barber have been replaced at the disposal of H.E. the Commander-in-Chief in India. Captain R. D. Saigol has arrived home on leave of absence from India.

TERRITORIAL FORCE.

Royal Army Medical Corps.

Lieutenant-Colonel Thomas Robinson Glynn, 1st Western General Hospital, Royal Army Medical Corps, is appointed to the Honorary Colonelcy of the Royal Army Medical Corps, Territorial Force, of the West Lancashire Territorial Division, vice Honorary Colonel Richard Caton, who is retired on completion of the tenure of his appointment.

1st London (City of London) Field Ambulance, Royal Army Medical Corps: Lieutenant Duncan C. L. Fitzwilliams to be Captain (dated July 3rd, 1913).

4th London Field Ambulance, Royal Army Medical Corps: Lieutenant Alfred John Williamson, from the 1st Highland Field Ambulance, Royal Army Medical Corps, to be Lieutenant (dated June 19th, 1913).

1st North Midland Field Ambulance, Royal Army Medical Corps: Captain James D. Allen resigns his commission (dated August 9th, 1913).

1st Northern General Hospital, Royal Army Medical Corps: William Frank Wilson to be Captain, whose services will be available on mobilisation (dated August 9th, 1913).

The undermentioned officers resign their commissions (dated August 13th, 1913): Captain Charles G. Watson and Lieutenant Hugh S. Gaskell. The promotion to a Captaincy of Lieutenant David R. Taylor is antedated to April 1st, 1908.

Attached to Units other than Medical Units.—Lieutenant Percy B. Spurgin to be Captain (dated May 16th, 1913). Captain Mark P. M. Collier resigns his commission (dated August 9th, 1913).

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

Lieutenant Philip W. Mathew to be Captain (dated June 30th, 1913).

The undermentioned to be Lieutenants (on probation): Frederick Livingstone Tulloch, late Cadet Lance-Sergeant, Edinburgh University Contingent, Officers Training Corps (dated June 16th, 1913). Cadet Staff-Sergeant Thomas William Edward Elliott, from the Belfast University Contingent, Officers Training Corps (dated July 7th, 1913).

THE GRAND PRIORY OF THE ORDER OF THE HOSPITAL OF ST. JOHN OF JERUSALEM IN ENGLAND.

The King has sanctioned the following promotions in and appointments to the Order of the Hospital of St. John of Jerusalem in England:—Major Henry Brydges Yates (from Esquire) and Lieutenant-Colonel Sydney Monckton Copeman, F.R.S. (from Honorary Associate), as Knights of Grace; and Major Francis Leonard Vaux, A.M.C. (Canada), and Lieutenant-Colonel John Taylor Fotheringham, A.M.C. (Canada), as Esquires.

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

The first article in the August issue of this journal is a reprint from the Proceedings of the Royal Society of a communication on Further Researches on the Extrusion of Granules by Trypanosomes and on their Further Development, by Major W. B. Fry and Captain H. S. Ranken. Mr. H. G. Plimmer, F.R.S., adds a note on a new method of blood fixation. In an article by Dr. M. S. Pembrey on Heat Stroke a tribute is paid to the valuable observations which have been made on this subject by medical officers of the British Army, for their introduction of the most practical and efficient treatment, and for a general recognition of external heat as the important factor. The enormous success of bacteriology in recent years, he says, may, however, lead to the acceptance on insufficient grounds of the view that "heat stroke" is a specific fever. and "the time, therefore, has come for conclusive observations and experiments to decide between the rival theories and thus enable preventative measures and treatment to be based upon scientific evidence and to be strictly enforced to prevent the toll which as death, disease, and inefficiency is year by year exacted by 'heat-stroke.'" Under the title of "Concerning Some Things Little Understood," Colonel R. H. Firth returns to the fascinating philosophical speculations which he from time to time gives his readers. Taking as his starting point a child's book which describes a world in which the law of cause and effect is absent and everything happens by chance, his musings lead him to confess a belief in the existence of a supernormal world, but on the condition that its operations are by and through physical agencies. His arguments bring him to the conclusion that mind and matter are not antithetical, but rather part of one great universe of substance, and that heat, light, and magnetism are mere modes of and definitely connected with the æther or soul of substance, and he asks whether it is too much to assume that when the nature of æther is better understood the mechanism of so-called occult phenomena may not be plain to us. Conceding so much, the possible explanation of leviation and the tying of knots in an endless cord seem to become mere child's play if we bring to that explanation the aid of the fourth dimension. As an interesting speculation bearing on the problem as to whether the human soul is but a name for the sum of vital functions or has an objective existence, embodied and disembodied, and as a stimulus to thought, Colonel Firth's article may be commended. Professor Leonard Hill's lecture on the Physiology of the Open-air Treatment, which was published in THE LANCET of May 10th, also appears in this issue.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Canine Tuberculosis.

ON July 29th M. Cadiot, a professor at the school of Alfort, related before the Academy of Medicine the history of a case of tuberculosis in the dog, introducing many curious details full of interest both from the point of view of comparative pathology and from that of public hygiene. He showed that tuberculosis in the dog is almost always of human origin, being especially found in animals belonging to those afflicted with pulmonary phthisis or dwelling in places infected by them. In Paris, as in all thickly populated communities, the clinical morbidity of tuberculosis in the dog is from 3 to 4 per cent., about three times as great as in the cat, and at least 500 times as great as in the horse. He also noted that tuberculosis is extremely common in dogs which dwell in certain public establishments—public-houses, cafés, and badly kept restaurants—where the ground is generally saturated with bacilliferous sputa, which suggests

that man himself may be also exposed to danger therein. Undoubtedly too the dog, which very generally contracts tuberculosis from man, may also convey it to him when the subject of open lesions, though it will not do to exaggerate either the frequency or the risk of this possibility. It is not so disquieting a fact as has been said; all that is necessary is to be aware of it. As yet canine tuberculosis is not extremely widely disseminated. The danger of its transmission thus to human beings is in fact rare, and almost negligible in comparison with transmission through human contagion.

The Effect of Meat on the Nutrition of Diabetics.

The action of meat in diabetics without loss of flesh has given rise to a very interesting discussion at the Société Médicale des Hôpitaux between M. Marcel Labbé and M. Rathery. Most authors hold that meat has an influence on the glycosuria of diabetics. This action is especially noticable in the grave forms of diabetes, but it exists also in benign ones. The case was reported of a diabetic excreting 13 grammes of sugar in whom the cutting off of meat caused a cessation of the glycosuria, whilst the ingesting of 200 grammes of meat brought back the glycosuria to its former extent. The glycosuria induced by the taking of meat never reaches very high figures and is in no wise comparable to that due to carbohydrates. In contradistinction to the opinions of M. Linossier and M. Lemoine both M. Labbé and M. Rathery conclude that meat has an influence on the glycosuria of diabetics without emaciation, but that this influence is neither constant nor regular, and that in practice it is not comparable to that of the carbohydrates. The restriction of carbohydrates remains, therefore, the keystone in the regimen of diabetics. The action of meat on the glycosuria of diabetics is explained by the contained glycogen, and especially by the carbohydrate products of protein metabolism.

A Prize for Research on Rheumatism.

A prize of 5000 francs has been put at the disposition of the *Matin* by an anonymous donor for the author of the investigations that shall be adjudged most greatly to advance our knowledge of the causative microbic factor in rheumatism, the essays to be sent in to that journal before Jan. 1st, 1914. The composition of the board of adjudication, which will consist entirely of medical men, is left to the *Matin*. The conditions of the competition will be laid down by the board.

The Agrégation.

Regulations respecting the transference from one faculty to another of *agrégés* in a faculty of medicine or a mixed faculty of medicine and pharmacy have been published. A vacancy occurring for an *agrégé* is published in the official journal. A compulsory delay of a month is then accorded, during which any *agrégé* is at liberty to apply for transference, but no such application will be accepted after the Ministerial decree announcing the concours for the vacancy has been published. The transference is announced by the Minister on the advice of the faculty to which the *agrégé* desires to become attached and of the Commission of Medicine and Pharmacy of the Consultative Committee of Public Instruction.

A Wound of the Spinal Cord.

On July 23rd at the Société de Chirurgie M. Potherat related the case of a young girl who had shot herself with a pistol. The bullet had penetrated the abdomen. He performed laparotomy and found considerable hæmorrhage from a wound of the lower surface of the liver, which he plugged with a tampon. There was also a small orifice in the lesser omentum, but as the bleeding had stopped M. Potherat did not interfere further. The next day the patient had total paraplegia, with paralysis of the bladder and rectum, and radioscopy showed the ball situated in the spinal canal at the level of the eleventh dorsal vertebra. As there was considerable wasting of the lower limbs and a trophic ulcer was found, he removed the arch of the eleventh dorsal vertebra and incised the dura mater in the region of a small ecchymotic patch of the width of some millimetres. The ball was found right in the centre of the cord. The operation is yet too recent for the ultimate result to be known.

The Association d'Enseignement Medical.

A series of conferences on various subjects in medicine, surgery, and the specialties will be held by the Association d'Enseignement Médical des Hôpitaux de Paris from Oct. 15th to 31st in the Hôpital de la Charité, Amphithéâtre Potain, Paris. Those announced to take part are Dr. Lucas-Championnière, Dr. Bensaude, Dr. Thibierge, Professor Broca, Dr. Michon, Dr. Rudaux, Dr. Ribadeau-Dumas, Dr. Poulard, Dr. Béclère, Dr. Courcoux, Dr. Labey, Dr. Sergent, Dr. Josué, Dr. Robineau, Dr. Hudelo, Dr. Lesné, Dr. P. E. Weil, Dr. Bazy, Dr. Roubinovitch, Dr. Savariaud, Dr. Queyrat, Dr. Le Noir, and Dr. Rist.

August 11th.

Correspondence.

"Audi alteram partem."

WEST HAM MEDICAL INSPECTORS: TEMPORARY ASSISTANTS.

To the Editor of THE LANCET.

SIR,—To prospective candidates for the above appointments I would offer the following information. Medical inspectors in West Ham have no status as assistants to the medical officer of health, and no medical inspector has ever been permitted to do any public health work, either in the schools or in the borough (population 310,000). And when the medical officer of health leaves the borough, either on holiday or otherwise, no assistant or deputy is left; the public health work is done by means of the Post Office and clerks. They are not permitted to do any refraction work. They simply select the cases, which are sent to a general practitioner called the oculist, who has a lucrative practice, and who gets 4*s.* per head for his eye work. The medical inspectors are not permitted to examine any mentally deficient or defective child referred as a special case during medical inspection by the teachers. Such cases are assigned by the medical officer of health to the care of a lay inspectress; and should such a case come under review as a routine examinee and a report be made on it to the medical officer of health it would still be relegated to the care of the lay inspectress. Through not being called assistant medical officer of health, one of my former colleagues lost a sure post as a medical officer of health. Up to the present West Ham is a very blind alley for medical inspectors. Verbal promises made at the beginning have not so far materialised. Two other more important points are likely to be taken from the medical inspectors, and when that takes place they will have reached the level of "superior office boys." But on the strength of the subjoined quotation such a step will be met by a strong representation to the Board of Education and a question in the House.

The quotation to which I refer appeared in a letter from the Board of Education to the London Education Committee, which was referred to in a full report which appeared in THE LANCET of August 2nd, p. 339. "The Board also suggest that the Council should consider the possibility of extending the functions of the assistant medical officers. There is a serious danger that unless more variety is introduced into their work the restriction of their duties in practice largely to routine medical inspection, re-examinations, and special examinations will have an injurious influence on the work generally."

Medical inspectors are simply tolerated by medical officers of health, and unless they take a firm stand now they will soon occupy a subordinate and unwarranted position in their profession.

Neither the Public Health Committee nor the Education Committee is to blame for the above state of affairs in West Ham.

I am, Sir, yours faithfully,

West Ham, August 7th, 1913. ALEX. GRAHAM.

THE LADIES' PLATE AT HENLEY REGATTA.

To the Editor of THE LANCET.

SIR,—While acknowledging my indebtedness to Dr. Adolphe Abrahams for his criticism, I should like to state that the brevity of my former letter probably placed me at a disadvantage in the full expression of my views, which are almost in complete accord with his own.

For 40 years I have held a brief for athletics both for boys and men, realising that both in the preparation for, and

performance of, athletic competitions the gain is enormous both on physical and mental grounds. I ask for no "grandmotherly legislation" with regard to schoolboys; let them compete by all means, but compete on fair and equal grounds, and let those who have the regulations of their athletics lend an open ear to the expert opinion of competent medical men, especially of those among us who have taken an oar at Henley, and who (as expressed in Dr. Abrahams' very able letter) have felt from experience that in the race "death" itself would seem preferable to the indescribable disgrace of stopping. Of such stuff is our English manhood made; but in all fairness let the race be equal, and is it fair to place growing boys in open competition with full-grown men, when from obvious physiological and medical reasons the former are unfit?

Better let "Eton, Radley, Bedford, and Shrewsbury scoff" than sap the vitality of the nation by ruining her sons. It is the unequal yoke inhibited on the best authority long ago against which I protest, for rowing in competition, as is well known by all Old Blues, is far more severe than any other form of sport. As a proof of my opinion I may state that I had this year the good fortune offered me of testing this fact through the kind assistance of a recognised authority in the rowing world.

My letter is too long, but to sum up my suggestions are for:—Approximate equality in age in competitive athletics (specially in rowing) and competent medical supervision in training.

I am, Sir, yours faithfully,

SHEPHERD BOYD, F.R.C.S. Irel.,
Harrogate, August 7th, 1913. Leander Rowing Club.

IMMUNISATIONS FOR RHEUMATIC INFECTIONS.

To the Editor of THE LANCET.

SIR,—In THE LANCET of August 2nd you quote me as having made the following statement during the discussion on Dr. A. P. Luff's paper on Fibrositis at the British Medical Association—viz., that I said: (1) "Excess of uric acid was a causative agent"; and that (2) "uric acid interfered with the effective action of salicylates." What I said was that it was necessary, when immunising for rheumatic infections, to correct the acidosis which was frequently present, as antibodies did not act properly if there was any reduction of the normal alkalinity of the blood and tissue fluids, and that for this purpose I used citrate of soda.

I am, Sir, yours faithfully,

Dublin, August 3rd, 1913. W. M. CROFTON.

A SCALE OF FEES.

To the Editor of THE LANCET.

SIR,—I am instructed to draw your attention, as a matter of general interest to the readers of THE LANCET to the undermentioned scale adopted by the London County Council in respect of payments to doctors for the first attendance to pupils, scholars, or students who meet with accidents at educational institutions maintained by the Council, or to children who meet with accidents at dining centres in the administrative county of London:—

	s.	d.
1. Where a child, pupil, scholar, or student is taken to a doctor's surgery	3	6
2. Where a doctor attends a child, pupil, scholar, or student	5	0

In exceptional circumstances claims in excess of the fees specified are specially considered. I should add that the regulation does not apply to residential schools maintained by the Council.

I am, Sir, your obedient servant,

JAMES BIRD,
Deputy Clerk of the Council.
County Hall, Spring Gardens, S.W., August 5th, 1913.

A CORRECTION.

To the Editor of THE LANCET.

SIR,—May I correct a statement attributed to me in the necessarily abbreviated report of the discussion on fibrositis at the recent meeting of the British Medical Association at Brighton in THE LANCET of August 2nd, p. 295. I drew no distinction about toxins, but the really important point seemed to me to be whether fibrositis is due (1) to many and varied organisms, just as pleurisy is; or (2) to one specific organism; or (3) to perverted metabolism, which is unlikely.

In brachial neuritis certain fixed spots nearly always become tender. I suggested, too, salicylic acid in lanoline, not salicylate ointment, to which the skin is probably impervious.

I am, Sir, yours faithfully,

Clifton, Bristol. G. PARKER.

TUBERCULOSIS OFFICERS.

To the Editor of THE LANCET.

SIR,—This is a very egotistical letter, yet one probably with bearings both topical and important. Nine years is the length of my special tuberculosis experience, the last five of them in sole resident charge of a 50-bed public sanatorium; I am under 40, a motor cyclist, a D.P.H., and have excellent testimonials. So I put in for a chief tuberculosis officership about 20 miles away. I know my application did not miscarry by the fact that in a week or so our county medical officer of health wrote me a very kind letter saying that his *confrère* of the area (X) in question had made inquiries of him about me, and that he had given a hearty recommendation. But the first news I had of the result of the election was a note from a local doctor asking that he and Dr. Z., the chief tuberculosis officer of X, might call and "get some hints." According to my 1910 Medical Directory the said Dr. Z. had no tuberculosis experience and no public health diploma. Well, they called. I had a "refill" of an artificial pneumothorax case fixed for that afternoon, and Dr. Z. was very glad to see his first case and some of the literature. There was an interesting throat case in. This phthisiologist tried to put on the head mirror the wrong way up, and after the error was corrected gave up the attempt at inspection without getting as far as making the patient open his mouth. A copy of the *Internationales Centralblatt f.d. gesamte Tuberkulose-Forschung* was new to him. So was Schröder and Blumenfeld's exhaustive work on the treatment of consumption. In fact, he did not read German, and seemed not too familiar with the title of the translation of Bandelier and Roepke's work on tuberculin. He asked me for my impressions of this last, and as the book had a year or two ago been sent me for review I was able to give them. Yet he gets the post of, to quote the advertisement, "expert adviser of the County Insurance Committee in regard to the diagnosis and treatment of cases of tuberculosis"—in spite, too, of the fact that he has had no sanatorium experience, which the same advertisement stipulated for—and I do not get on to the short list or even have my application acknowledged.

I believe there are others in my plight; it is in our name that I write. When successful candidates of the above description visit our institutions it is easy enough, at the cost of a (I hope) quite minimal infraction of the laws of hospitality, for us to indulge ourselves in what a clever journalist called "the priceless luxury of intellectual contempt." We would rather, however, have £500 a year for work we are fond of and which we have taken constant trouble to make ourselves competent in. If denied this, what chance is there of harmonious working with duffers to whom it is proposed to give a sort of suzerainty over us, unless, as is probable, they take care to sing small?

I enclose my card, but, of course, do not desire the publication of my name.

I am, Sir, yours faithfully,

August 3rd, 1913. LONGLISTER.

UNIVERSITY OF LIVERPOOL.—Dr. W. C. McC. Lewis, having been appointed to the chair of physical chemistry in the University of Liverpool, has resigned his office in connexion with the Department of Chemistry at University College. Dr. Roland Edgar Slade has been elected to succeed him.—Dr. A. J. Clark, assistant in the department of pharmacology at University College, Liverpool, has been appointed lecturer in pharmacology at Guy's Hospital Medical School.

Medical News.

UNIVERSITY OF OXFORD.—The following candidates have been approved for the Diploma in Ophthalmology:—

Harriet R. D. Ford, David Horgan, K. N. Karanjia, G. C. L. Kerans, G. H. Oliver, D. D. Paton, and A. C. Reid.

UNIVERSITY OF LONDON.—At examinations held in July the following candidates were successful:—

FIRST EXAMINATION FOR MEDICAL DEGREES.

Gustave Adler, London Hospital; Roy Douglas Aylward, Tonbridge School and London Hospital; Santiago Ernesto Barraza, University College; Maung Ba Thin, Guy's Hospital; John Churchill Blake, University College; Harold John Blampied, St. Thomas's Hospital; Joseph Erwin Adolphe Bouchaud and Geoffrey Bourne, St. Bartholomew's Hospital; *†Norman Jesse Boxall, Epsom College; Charles Hargreaves Bracewell, University of Liverpool; Henry Walter Breese, Birkbeck College; Cyril Huleatt Brew, University College; Reginald Bertram Britton, University of Bristol; Elsie Charlotte Bulley, University of Liverpool; Ellinor Marjorie Burnett, Hartley University College; Francis Caldecott and Donald Cameron, Epsom College; Duncan Gillard Churcher, City of London School; Henry Joseph Constantine Churchill, St. Bartholomew's Hospital; *†Wilfrid Edward Le Gros Clark, St. Thomas's Hospital; Apollo John Cokkinis, St. Mary's Hospital; Eric Vere Corry, Epsom College; William Adlington Date, Epsom College and University Tutorial College; Charles Owen Davies, University College, Aberystwyth; George Vincent Davies, Epsom College; Edwin Frank Deacon, Guy's Hospital; Phyllis Decima Dixon, London (Royal Free Hospital) School of Medicine for Women; Howard Lexster Douglas, London Hospital; Monte Edwards, St. Thomas's Hospital; David Washington Evans, University of Bristol; Grace Hamilton Ewart, London (Royal Free Hospital) School of Medicine for Women; William Feldman, University College; Louis Alfred Roger Gaud and John Gay, St. Bartholomew's Hospital; Maximilian Walter Geffen, University College; Nannie Gibson and Dorothy Gilford, London (Royal Free Hospital) School of Medicine for Women; Ernest Howard Glenny, St. Bartholomew's Hospital; Henry Gluckman, London Hospital; *Eryl Glynne, University College, Bangor; Alice Muriel Griffiths, University College, Cardiff; Herbert Glynn Hall, University College; Joan Hardy, London (Royal Free Hospital) School of Medicine for Women; Cecil Gordon Harper, Middlesex Hospital; Leslie William Hefferman, Epsom College; Bertha Hinde, University Tutorial College; Eric Clark Hinde, Guy's Hospital; George Franklin Wise Howorth, Mercers' School and Middlesex Hospital; Naunton Reginald Jenkins, University College, Cardiff; Henry Cyril Conwy Joyce, St. Bartholomew's Hospital; Amy Margaret Kerr, London (Royal Free Hospital) School of Medicine for Women; John Isaic Kühne, King's College; Felix Raoul Leblanc, Guy's Hospital; Lloyd Kirwood Ledger, St. Bartholomew's Hospital; Emily Catherine Lewis, London (Royal Free Hospital) School of Medicine for Women; Pao Tsang Liang, Mill Hill School and St. Bartholomew's Hospital; Gordon Parmiter Lindsay, Guy's Hospital; Alice Lloyd Lloyd-Williams, London (Royal Free Hospital) School of Medicine for Women; William Alexander Low, St. Thomas's Hospital; Kenneth McFadyean and Bruce Maclean, University College; Thomas Hawks McLeod, King's College; Bernard Gouldsmith Marshall, Epsom College; Charles Leslie Mason, St. Mary's Hospital and Epsom College; Farid Morcos, St. Mary's Hospital; Ernest Rudolf Dudley Nagel, St. Thomas's Hospital; Martin Herbert Oldershaw, University College; Alexander Edward Patrick Parker, William Ellis Endowed School and Birkbeck College; Arthur Edmund Beer Paul, University College; Eric Denholm Pridie, University of Liverpool; Henry Norman Pritchett, Guy's Hospital; William Russell Ranson, Epsom College; Olive Rendel, London (Royal Free Hospital) School of Medicine for Women; John Charles Ryder Richardson, St. Paul's School; Gabriel Francis Rodrigues, Madras Medical College and University College; Gwendolen Mary Rolfe, London (Royal Free Hospital) School of Medicine for Women; James Paterson Ross, St. Bartholomew's Hospital; Henry Rowan, University College; William Harris Royal, University of Bristol; Eleanor May Scarborough, London (Royal Free Hospital) School of Medicine for Women; Simeon Cyril Shaw, Birkbeck College; Montague Beavan Tench, Middlesex Hospital; Benjamin Thomas, Epsom College; Daniel Jenkin Thomas, B.Sc., private study; *John Herbert Thomas, University Tutorial College; George Edwin Tilsley, University of Bristol; Charles Maitland Titterton, St. Bartholomew's Hospital; Alfred Robert Tothill, King's College; Richard Wake Twining, Epsom College; Alfred James Usborne, private tuition and study; Richard Walters, London Hospital; Sydney Arthur Thomas Ware, St. Thomas's Hospital; Frederick William Arbuthnot Watt, London Hospital; Alfred C. S. Whiteway-Wilkinson, University College; Idwal Glynne Williams, University College, Bangor; Sydney Carver Woodhouse, King Edward's High School, Birmingham; Irene Yates, London (Royal Free Hospital) School of Medicine for Women; and Frank Young, Guy's Hospital.

* Distinction in Inorganic Chemistry. † Distinction in Physics.

SECOND EXAMINATION FOR MEDICAL DEGREES, PART I.

Organic and Applied Chemistry.—Girdhar Clement Agarwala, London Hospital; James Reid Banks, University College; Grace Mary Beaven, London (Royal Free Hospital) School of Medicine for Women; Herbert Frederic Gustave Berncastle, Guy's Hospital; Alethea Josephine Bolton, University College, Nottingham, and private study; Guy William John Bousfield, St. Thomas's Hospital; Octavius Cyril Carter, London Hospital; Philip Caro Leslie Carrier, Charing Cross Hospital; John D'Arcy Champney, University of Bristol; Percy Selwyn Clarke and Philip Nield Cook, St. Bartholomew's Hospital; Dorothy Trevor Daintree, London (Royal Free Hospital) School of Medicine for Women; Robert Cecil Davenport, St. Bartholomew's Hospital; John Milton Davey, University of Leeds; Andrew Norman M. Davidson, King's College; George Day, St. Bartholomew's Hospital; James Daniel Dyson, Middlesex Hospital; Arthur William Foster Edmonds, Clarence Franklin Eminson, and Lionel Bernard Goldschmidt, King's College; Hubert Oliver Gunewardene, Ceylon Medical College and University College; Iris Harding, London (Royal Free Hospital) School of Medicine for Women; Arthur Reginald Hart, King's College and Westminster Hospital; Graham William Heckels, Guy's Hospital; Blanche Aspasie M. Henderson, Victoria University of Manchester and University College; William Andrew Hewitson, University of Durham; Charles Arundel Hutchinson, London Hospital; John Wilkinson Davis Hyde, University College; Helen Ingleby, London (Royal Free Hospital) School of Medicine for Women; Jack Joffe, Guy's Hospital; Stewart Russell Johnston, University College; Vivian Emrys Jones, University College, Bangor; Michael Harry Kirkpatrick Kane, University College; George Edwin Kidman, Guy's Hospital; Charles Ainger Kirton, University College; Edward Eric Lightwood, King's College and Westminster Hospital; Marguerite Frances Jane Lowenfeld and Ethel Marion McCartney, London (Royal Free Hospital) School of Medicine for Women; Malcolm Henry Mackeith, Hartley University College and Queen's College, Oxford; Humphrey Ingilby Mariner, St. Thomas's Hospital; Arthur Morford, St. Bartholomew's Hospital; Arthur Harry Morris, University of Bristol; John James Murphy, London Hospital; Noel Olivier and Irene Grace Parsons, London (Royal Free Hospital) School of Medicine for Women; Eric Finch Peck, University of Liverpool; Victor J. E. C. del S. Perez y Marzan, University College; Edwin Seymour Phillips, Guy's Hospital; Bertram Henzell Pidcock, St. Bartholomew's Hospital; Sybil Madeline Georgina Pratt, London (Royal Free Hospital) School of Medicine for Women; Thomas Dawson Pratt, University of Leeds; Stephen Henry de Grave Pritchard, London Hospital; Charles Nathaniel Read, King's College; Joyce Baron Reed, London (Royal Free Hospital) School of Medicine for Women; Paul Rigauld Riggall, University College; Henry Bret Russell, St. Paul's School; Mandell Shimberg, London Hospital; Ellen Sylk, London (Royal Free Hospital) School of Medicine for Women; Aubrey Leonard Telling, Leeds Technical School and private tuition; Arthur Anton Thiel, St. Bartholomew's Hospital; Norman Beattie Thomas, University College, Bangor; Ralph Edwin Stuart Webb, Middlesex Hospital; Arthur William Wells, London Hospital; Effie Adela Wharton, London (Royal Free Hospital) School of Medicine for Women; Graham Selby Wilson, King's College; and Campbell Young, University College.

FOREIGN UNIVERSITY INTELLIGENCE.—*Basle:* Dr. Corning, extraordinary professor of anatomy, has been promoted to Ordinary Professor.—*Berlin:* Dr. Claus, laryngologist and otologist to the Rudolf Virchow Hospital, has been granted the title of Professor. Dr. His, who was offered von Noorden's chair in Vienna, has decided to remain in Berlin. Dr. August von Wassermann has been nominated Director of the Kaiser Wilhelm Institute of Experimental Therapeutics now being built in Dahlem. Dr. Karl Stolte has been recognised as *privat-docent* of Children's Diseases, and Dr. Thomas as *privat-docent* of Medicine.—*Bonn:* Dr. Hans Hinselmann has been recognised as *privat-docent* of Midwifery and Gynæcology.—*Breslau:* Dr. Erich Frank has been recognised as *privat-docent* of Medicine.—*Bucharest:* Dr. Brukner has been appointed to the chair of Histology.—*Budapest:* Dr. Karl Borszeky and Dr. Tiberius Verebelly, *privat-docenten* of surgery, have been granted the title of Extraordinary Professor. Dr. K. Lang has been recognised as *privat-docent* of Rhinology.—*Charlottenburg:* Dr. Ernst Barth, senior staff surgeon, has been appointed Municipal Laryngologist and Otologist.—*Clausenburg (Koloszvár):* Dr. Sigmund Jakabházy, *privat-docent*, has been promoted to the chair of Pharmacology.—*Cologne Academy of Practical Medicine:* Dr. Ewald H. Hering has been offered the chair of Physiology. Dr. Reiner Müller, of Kiel, has been offered the charge of the Institute of Hygiene and Bacteriology which is to be built.—*Copenhagen:* Dr. S. Monrad, lecturer on children's diseases, has been granted the title of Professor.—*Göttingen:* Dr. Löwe has been recognised as *privat-docent* of Pharmacology.—*Greifswald:* Dr. G. Schöne, *privat-docent* of surgery, and Dr. F. Cohn, *privat-docent* of midwifery, have been granted the title of Professor.—*Groningen:* Dr. J. van de Hoeve, of Utrecht, has been appointed to the chair of Ophthalmology.—*Innsbruck:* Dr. Felix von Werdt has been recognised as *privat-docent* of Pathological Anatomy.—*Jassy:* Dr. Dobrovici has been appointed to the chair of Internal Pathology.—*Jena:* Dr. Rudolf Eden has been recognised as *privat-docent* of Surgery.—*Königsberg:* Dr. Benthin has been recognised as *privat-docent* of Gynæcology.—*Leipsic:* Dr. Versé, *privat-docent* of pathological anatomy, has been appointed Extraordinary Professor.—*Lyons:* Dr. E. M. Martin, professeur agrégé, has been promoted to the chair of Forensic Medicine.

WEST LONDON POST-GRADUATE COLLEGE.—A short vacation course lasting three weeks will commence at this college on August 18th, the syllabus for the ensuing week being announced in the Diary of THE LANCET.

Dr. Henry Buchanan Murray, of Belfast, was admitted by the Right Hon. the Lord Mayor of Dublin a freeman of that city at a court held in the Dublin City Hall on July 8th.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON).—The following scholarship and prizes have been awarded:—Senior scholarship and prize in diseases of children, Mr. C. F. Hacker; medicine prize, Mr. A. E. Panter; obstetric medicine prize, forensic medicine prize, and clinical surgery prize, Mr. F. H. Mosse; Todd prize and Tanner prize, Mr. E. W. Carrington.

THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The Baly medal of the College has been awarded to Dr. John Scott Haldane, F.R.S., reader in physiology at the University of Oxford. The award is made every other year to the person who shall have most distinguished himself in the science of physiology.—The Charles Murchison scholarship, which is awarded alternately by the University of Edinburgh and the Royal College of Physicians, has been awarded by the University to Dr. Alan William Stuart Sichel.

BRISTOL ROYAL INFIRMARY.—At the half-yearly meeting the chairman, Sir George White, in reporting progress for the preceding six months, referred to the great loss sustained by the city in the loss of Mr. J. S. Fry, the chairman of the General Hospital. The in-patients numbered 2490, an increase of 53 over the corresponding six months of 1912, and the out-patients 21,649, a falling off of 3352, no doubt due to the operation of the National Insurance Act. The financial statement was not reassuring, the six months' income being £7716 and the expenditure £10,446. The chairman made his usual appeal for more subscribers, and mentioned that the Prince of Wales had sent a subscription of £10.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Experiments on Living Animals.

Mr. ELLIS GRIFFITH, Under Secretary for the Home Office, moved in the House of Commons on August 6th, an address for a return "showing the number of experiments on living animals during the year 1912, under licences granted under the Act 39 and 40 Vict. c. 77, distinguishing the nature of the experiments."

Two Scottish Bills.

Two Scottish Bills, the Mental Deficiency and Lunacy (Scotland) Bill and the Highlands and Islands (Medical Service) Bill, passed the third reading in the House of Commons on August 6th.

Public Health (Treatment of Disease) Bill.

The Public Health (Prevention and Treatment of Disease) Bill passed through Committee in the House of Commons on August 6th, and on August 7th was read the third time.

HOUSE OF COMMONS.

WEDNESDAY, AUGUST 6TH.

A Restricted Choice of Doctor.

Sir HENRY CRAIK asked the Secretary to the Treasury whether, in view of the fact that the choice of doctor was materially restricted in the case of insured persons in Wisbech owing to the exclusion of several local doctors from the panel, he was prepared to grant a special inquiry into the administration of medical benefits in the Isle of Ely.—Mr. MASTERMAN replied: I have fully explained the circumstances which led to the suspension of the normal panel arrangements in the area referred to. No representations have been received from the Insurance Committee or from insured persons resident in the area that the arrangements which have been sanctioned for the provision of medical benefit to insured persons are inadequate, and I see no reason for instituting such an inquiry as is suggested by the honourable Member.

The Sight Tests of the Board of Trade.

Major WHITE asked the President of the Board of Trade whether he was aware that at the recent annual meeting of the British Medical Association at Brighton a resolution was adopted, with one dissentient, by the Ophthalmological Section, and recommended to the Council of the British Medical Association, that the sight tests of the Board of Trade were not satisfactory, and that an inquiry was urgently needed in the interests of the Mercantile Marine and of the nation; and, if so, whether he proposed to take any action in respect to this recommendation.—Mr. J. M. ROBERTSON replied: I have seen a statement in the press to the effect that such a resolution was carried. The Board of Trade have, however, received no communication from the Association on the subject, and I am not aware of the grounds on which the resolution was based. As the honourable Member is aware, the sight tests now used were adopted on the recommendation of a strong Departmental Committee which recently investigated the whole question, and I see no necessity for any further Committee of Inquiry.

THURSDAY, AUGUST 7TH.

Vaccination Lymph.

Mr. LYNCH asked the President of the Local Government Board (1) whether, in the lymph used by his department for vaccination purposes the germs of variola were living or dead, and whether the germs of cow-pox were living or dead; whether any means existed by which their relative strength might be ascertained, or by which purity of the lymph might be guaranteed, or by which any standardisation, even of the roughest kind, might be obtained; whether he had had his attention called to the researches of Dr. Criado y Aguilhar, who concluded that what was ordinarily called small-pox was due to a mixed infection, and that frequently the lymph employed was richer in the germs of accompanying diseases than in those of variola; and whether any scientific research was in progress in his department which would throw light on this subject; and (2) whether, in the system of vaccination adopted by his department any attempt was made to distinguish between the specific germs of variola and of cow-pox; if so, whether he could state the means employed; whether, in the event of these being undistinguishable by reason of the fact that neither had been identified, the results obtained were believed to be due to inoculation with the germs of variola or with those of cow-pox; whether, in case no discrimination in the matter was possible, vaccination with cow-pox germs was held to provide immunity against variola; whether, having regard to the advisability of establishing this technique on a scientific basis, his department had ever carried through any series of experiments to determine the points indicated; and, if not, whether it would now do so.—Mr. BURNS (President of the Local Government Board) replied: The germs of cow-pox and variola have not so far been identified; it is, therefore, impossible to give the honourable Member the comparative information he desires concerning them. The subject is constantly engaging the attention of my advisers.

Mr. LYNCH: Does the right honourable gentleman observe that these questions really state the case for putting the whole matter on a sound basis?—Mr. BURNS: That may be a matter of opinion. The object which the honourable Member wishes to secure by his questions has been engaging attention for some time, and, as the honourable Member is probably aware, the Grocers' Company have offered a reward of £1000 for the discovery of the germ of small-pox.

Inoculation Researches.

Mr. LYNCH also asked the President of the Local Government Board whether his attention had been called to recent researches on the Continent, in various scientific centres, which indicated that inoculation with the germs of certain diseases might render the subject more susceptible to the attacks of other diseases; whether, in view of this fact, he had investigated the effect of vaccination on the resistance of children to anterior poliomyelitis, which disease was increasing in frequency and virulence, and which now presented a greater danger to children than small-pox; and whether his department proposed to establish any system of inoculation against anterior poliomyelitis.—Mr. BURNS answered: My attention has been called to the researches mentioned. The establishment of any system of inoculation against anterior poliomyelitis is not practicable at the present time in view of the fact that no reliable protective serum has yet been prepared.

Mr. FORSTER: Is it not a fact that the percentage of children successfully vaccinated is steadily declining?—Mr. BURNS: That question has no relation to poliomyelitis, but what the honourable Member says is correct.

Mr. LYNCH further asked the President of the Local Government Board whether, in view of the fact that in the cases of tuberculosis, typhoid fever, diphtheria, and certain other diseases, the specific germ was known, cultures and attenuations were possible, and standardisation might be roughly obtained, his department would set on foot a national system of inoculation against these diseases; or whether, if he held that the diminution of the evil of these diseases both in regard to extent and virulence had been brought about by various agencies within control, notably by increased attention to sanitary systems, he would attach yet greater importance to this aspect of the question of public health, and make use of it rather than of indiscriminate inoculation as his chief means of combating small-pox.—Mr. BURNS replied: As at present advised, I am not prepared to set on foot a national system of inoculation against the diseases mentioned. I may, however, draw the honourable Member's attention to an Order issued by the Local Government Board in 1910 giving powers to local authorities under certain conditions to supply diphtheria antitoxin and medical assistance in connexion therewith. My department always attaches the greatest importance to improved sanitation.

Mr. LYNCH finally asked the President of the Local Government Board whether his attention had been directed to the fact that wherever inoculation could be even roughly controlled by standardisation and the results estimated with some approach to accuracy, as, for example, Sir Almoth Wright's inoculations with tuberculin and his estimations by aid of the opsonic index, the period of immunity had been found surprisingly short; whether any scientific experiments had ever been set on foot in his department to ascertain the period of immunity attained by vaccination; whether, otherwise than by guesswork, it was set down at a number of years instead of the corresponding number of weeks; and whether, as the ascertainment of this point lay at the base of the theory on which his department acted, any experiments had been or were now in progress to conduct these operations on scientific lines.—Mr. BURNS replied: My attention has been drawn to Sir Almroth Wright's experiments. As regards the protective effect of vaccination against small-pox, I would refer the honourable Member to Section 377 of the Final Report of the Royal Commission on Vaccination.

Mr. LYNCH: Does the right honourable gentleman observe that if the time of immunity is really short it will affect the reading of the whole of the statistics which have been relied upon by his department in favour of the present mode of vaccination?—Mr. BURNS: Yes; but the time of immunity is nothing like so short as the honourable Member suggests by his supplementary question. Paragraph 377 of the Report of the Royal Commission on Vaccination gives the period of protection as nine or ten years. The honourable Member almost suggests a few months.

Mr. LYNCH: I make no suggestions whatever. I simply repeat the results of Sir Almroth Wright's investigations.—Mr. BURNS: I think my honourable friend and I might beneficially enlighten ourselves during the holidays upon this rather technical subject.

Payments for Medical Treatment by an Insurance Committee.

Sir FREDERICK LOW asked the Secretary to the Treasury whether, seeing that the amount due to the Norwich Friendly Societies' Medical Institute for medical treatment, sanatoria, drugs, &c., for the quarter ended April 11th, 1913, was £673 18*s.* 3*d.*, and for the quarter ended July 12th, 1913, £692 6*s.* 6*d.*, making in all £1369 4*s.* 9*d.*, and the only payments the institute had received were May 2nd £370 and July 9th £300, making in all £670, he would impress upon the Norwich Health Insurance Committee the necessity for the immediate discharge of the balance due to the institute and for greater promptitude of payments in the future in order that the institute might properly perform its responsibilities to the medical men and others attached to the institute, which had upwards of 6000 insured persons dependent upon it.—Mr. W. BENN (for the Secretary to the Treasury) replied: I do not know how my honourable friend has calculated the amounts which he refers to as due to the institution. Any payments made at the present time to approved institutions must be in the nature of advance payments only, and the amount of such advances must depend upon the expenditure actually incurred in the provision of medical attendance and treatment for insured persons. I understand that the Insurance Committee are prepared to make a further advance on receiving the necessary evidence of such expenditure.

Panel Doctors.

Mr. HICKS BEACH asked the Secretary to the Treasury how many insured persons had not yet selected their panel doctor, and when they would be allotted to the various doctors on the panel whose lists are not yet full.—Mr. W. BENN replied: I am unable at present to give the honourable Member the information asked for in the first part of the question. With regard to the latter part of the question, arrangements for allocation differ according to local circumstances, and no uniform date can be fixed, but arrangements have been made whereby any insured person can without delay obtain the services of a practitioner on the panel.

Mr. HICKS BEACH further asked the Secretary to the Treasury whether he was aware that many doctors had so far received no remuneration for their services as panel doctors for the quarter ending July 13th, and that many have still a considerable balance owing to them for the quarter ending April 13th; and what was the cause for this delay of payment of money due to them.—Mr. W. BENN replied: The honourable Member is under a misapprehension in thinking that a payment of a previously ascertainable amount is due at the end of each quarter of the calendar year to each doctor now on the panel. The regulations provide that the Insurance Committee shall make payments in advance at the end of each quarter of such amounts as may be agreed for this purpose between it and the doctors on the panel, but the precise amount actually due to any particular doctor can only be finally determined when all the various factors in the year's working of the Act have been ascertained and allowed for. I am not aware of any case in which advances have not been made in respect of both the first and the second quarter of this year.

Mr. GWYNNE: Will the honourable gentleman say whether there is any standard fixed as to the percentage?—Mr. BENN: I do not know whether there is a standard. I imagine that is within the discretion of the Committee. If the honourable gentleman will give due notice I will ascertain.

MONDAY, AUGUST 11TH.

The Medical Staff of the Home Office.

Mr. O'GRADY asked the Secretary of State for the Home Department whether there was any intention of increasing the medical staff of the Factory Department to deal with industrial diseases; whether he would consider the necessity of appointing medical referees to diagnose and report upon injuries, serious and otherwise, in cases where the victims of accidents were too poor to pay legal and medical costs; and whether he could state the number of qualified practitioners appointed in conjunction with the administration of the Factories Act and the Regulations under the same.—Mr. MCKENNA replied: One medical inspector is being added to the staff, making three medical inspectors in all. Medical men are also appointed under the Act and Regulations throughout the country for the purpose of examining children and young persons, inquiring into accidents and poisoning cases, and examining workmen in certain dangerous industries; the number of these medical men is 2118. I do not quite understand the second part of my honourable friend's question. If he is referring to proceedings under the Compensation Act, a worker injured by accident is not required by that Act to obtain any medical certificate for the purpose of making a claim for compensation. A worker suffering from an industrial disease has to obtain a certificate from the certifying surgeon, but the fee is only 1*s.* in cases where the certifying surgeon gives the certificate on the result of the examination made by him in pursuance of his duties under the Factory Act, and 5*s.* in other cases; and if the worker is refused a certificate and appeals to the medical referee, the referee's fee is paid by the State. I have no evidence before me to show the need for any change in the system.

BOOKS, ETC., RECEIVED.

ARNOLD, EDWARD, London.
Industrial Poisoning from Fumes, Gases, and Poisons of Manufacturing Processes. By Dr. J. Rambousek, Prague. Translated and edited by Thomas M. Legge, M.D., D.P.H. Price 12*s.* 6*d.* net.

ATKINSON, ROBERT, LIMITED, London.
Brazil in 1912. By J. C. Oakenfull. Price 5*s.* net.

BALE (JOHN), SONS, AND DANIELSSON, LIMITED, London.
Epidemic Infantile Paralysis (Heine-Medin Disease). By Professor Paul H. Römer. Translated by H. Ridley Prentice, M.B., B.S. Lond., M.R.C.P. Price 7*s.* 6*d.* net.

BREWING TRADE REVIEW, 13, Little Trinity-lane, London, E.C.
Practical Management of Pure Yeast. The Application and Examination of Brewery, Distillery, and Wine Yeasts. By Alfred Jörgensen, Copenhagen. Translated by R. Grey. Second edition, revised and greatly extended by the Author. Price 5*s.* net.

CASSELL AND COMPANY, LIMITED, London, New York, Toronto, and Melbourne.
The Student's Handbook of Gynæcology. By George Ernest Hermann, M.B., F.R.C.P. Lond. Price 7*s.* 6*d.* net.
Common Diseases. By Woods Hutchinson, M.A., M.D. Price 6*s.* net.

CHURCHILL, J. AND A., London.
Book for Mothers on the Management of Children in Health and Disease. By Mrs. A. M. Usher. With Introduction by Francis B. Rutter, M.D., F.R.C.S. Price 1*s.* net.
Obstetric Aphorisms for the Use of Students Commencing Midwifery Practice. By Joseph Griffiths Swayne, M.D. Eleventh edition, revised and edited by Walter Carless Swayne, M.D., B.S. Lond., M.D., Ch.B. Bristol. Price 3*s.* 6*d.* net.
Dr. Chavasse's Advice to a Mother on the Management of Her Children. Revised by T. D. Lister, M.D. Seventeenth authorised edition. Price 1*s.* 6*d.* net.

CLIVE, W. B., UNIVERSITY TUTORIAL PRESS, LIMITED, London and Oxford.
Certificate Hygiene. Edited by Rev. A. W. Parry, M.A., B.Sc. Price 1*s.* 6*d.*

COLLINS, WILLIAM, SONS AND CO., LIMITED, London and Glasgow.
The Principles of Evolution. By Joseph McCabe. Price 1*s.* net.
The Feminist Movement. By Ethel Snowden. Price 1*s.* net.

CORNISH BROTHERS, Birmingham.
Contributions to Practical Medicine. By Sir James Sawyer, of London, Doctor of Medicine of University, Fellow of Royal College of Physicians. Fifth edition, with many revisions and additions. Price not stated.

EWART, SEYMOUR, AND CO., LIMITED, 12, Burleigh-street, Strand, London, W.C.
Protein and Nutrition. An Investigation. By Dr. M. Hindhede. Price 7*s.* 6*d.* net.

FUNK AND WAGNALLS COMPANY, New York and London.
The Heart and Blood-Vessels; their Care and Cure and the General Management of the Body. By I. H. Hirschfeld, M.D. Price $1.25 net.

GILL, GEORGE, AND SONS, London.
Home Health and Domestic Hygiene. By Sir John Collie, M.D., C.M., and C. F. Wightman, F.R.C.S. Price 9*d.* net.

GILL, L. UPCOTT, AND SON, LIMITED, London.
Beauty for Ashes. By Lady Henry Somerset. Price 5*s.* net.

GREVEL, H., AND CO., 33, King-street, Covent Garden, London, W.C.
Chemistry in Daily Life. Popular Lectures. By Dr. Lassar-Cohn. Translated by M. M. Pattison Muir, M.A. Fifth edition, revised and augmented. Price 6*s.*

GRIFFIN, H. HEWITT, Putney.
Sports Management, including Motor Gymkhanas and Clocks Clockers and Clocking. By H. Hewitt Griffin, F.R.S.S., M.J.I. Price 1*s.* net.

HEALTH DEPARTMENT OF THE CITY OF NEW YORK.
Handbook of Information regarding the Routine Procedure of the Division of Communicable Diseases. By J. S. Billings, Junr., M.D. Price not stated.

HODGE, WILLIAM, AND COMPANY, Edinburgh and London.
Eugene Aram, His Life and Trial. By Eric R. Watson, LL.B. Price 5*s.* net.

HOUGHTON MIFFLIN COMPANY, Boston, Mass.
Calm Yourself. By George Lincoln Walton, M.D. Price not stated.

KEGAN PAUL, TRENCH, TRÜBNER, AND CO., LIMITED, London.
Evolution by Coöperation. A Study in Bio-economics. By Hermann Reinheimer. Price 3*s.* 6*d.* net.

KIMPTON, HENRY, London. STENHOUSE, ALEXANDER, Glasgow.
The Development of the Human Body. A Manual of Human Embryology. By J. Playfair McMurrich, A.M., Ph.D., LL.D. Fourth edition, revised and enlarged. Price 12*s.* 6*d.* net.

LAURIE, T. WERNER, LIMITED, London.
An Irish Gentleman, George Henry Moore. By Colonel Maurice George Moore, C.B., with a Preface by George Moore. Illustrated. 16*s.* net.

LEWIS, H. K., London.
The Bradshaw Lecture on the Diagnosis and Treatment of Incipient Pulmonary Tuberculosis. Delivered before the Royal College of Physicians of London, Nov. 5th, 1912. By David Bridge Lees, M.D. Cantab., F.R.C.P. Lond. Price 5*s.* net.
The Place of Climatology in Medicine. Being the Samuel Hyde Memorial Lectures read before the Section of Balneology and Climatology of the Royal Society of Medicine, May 20th and 21st, 1913. By William Gordon, M.A., M.D. Cantab., F.R.C.P. Lond. Price 3*s.* 6*d.* net.

LONGMANS, GREEN, AND CO., London.
London Public Health Administration. A Summary showing the Principal Authorities with their Origin, Services, and Powers. By W. McC. Wanklyn, B.A. Cantab., D.P.H. Price 2*s.* 6*d.* net.

MACMILLAN COMPANY, THE, New York.
A Laboratory Guide to the Study of Parasitology. By W. B. Herms, University of California, Berkeley, California. Price 3*s.* 6*d.* net.

MARLBOROUGH, E., AND Co., London.
Latin Self-taught. By John Topham, Barrister-at-Law. Price, wrapper, 1s.; cloth, 1s. 6d.

METHODIST PUBLISHING HOUSE, Singapore.
On the Hygienic Management of Labour in the Tropics. An Essay (with which is incorporated the Labour Code by courtesy of the F.M.S. Government). By P. N. Gerrard, B.A., B.Ch., B.A.O., M.D. Dublin University, D.T.M.H. Cambridge University, L.M. Rot. Price not stated.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

ASHE, H. P., M.R.C.S., L.R.C.P. Lond., has been appointed Resident Casualty Officer at King's College Hospital.

BANNERMAN, JAMES, M.B., C.M. Edin., has been appointed Medical Officer of Health for the Combined Weardale Rural District.

BRIDE, T. MILNES, M.D. Vict., has been appointed Honorary Ophthalmic Surgeon to the Northern Hospitals for Incurables, Manchester.

BRISCOE, J. CHARLTON, M.D. Lond., F.R.C.P. Lond., has been appointed Lecturer on Practical Medicine at King's College Hospital Medical School.

CHEATLE, G. LENTHAL, C.V.O., C.B., has been appointed Joint Lecturer on Surgery at King's College Hospital Medical School.

CLAYTON, E. B., M.B., B.S. Cantab., has been appointed Medical Officer in Charge of the Department of Massage and Electro-therapeutics at King's College Hospital.

DALTON, NORMAN, M.D. Lond., F.R.C.P. Lond., has been appointed Lecturer on Medicine at King's College Hospital Medical School.

FLUX, G. B., M.D. Durh., has been appointed Instructor in Anæsthetics at King's College Hospital Medical School.

HELLIER, JOHN BENJAMIN, M.D. Lond., has been appointed one of the Examiners in Midwifery and Diseases of Women to the Royal College of Physicians of London.

JENKINS, G. J., M.B., C.M. Edin., F.R.C.S. Eng., has been appointed Lecturer on Practical Otology at King's College Hospital Medical School.

KNOX, ROBERT, M.D., C.M. Edin., has been appointed Teacher of Radiography at King's College Hospital Medical School and Radiographer to the Hospital.

LEGG, T. PERCY, M.B., M.S. Lond., F.R.C.S. Eng., has been appointed Lecturer on Operative Surgery at King's College Hospital Medical School.

LYLE, H. WILLOUGHBY, M.D., B.S. Lond., F.R.C.S. Eng., has been appointed Lecturer on Practical Ophthalmology at King's College Hospital Medical School.

O'BRIEN, M. A. A., L.R.C.P. & S. Irel., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Fermoy District of the county of Cork.

O'KELLY, T., M.D. R.U.I., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Chipping Norton District of the county of Oxford.

PLAYFAIR, HUGH, M.D. Lond., M.R.C.P. Lond., F.R.C.S. Eng., has been appointed Lecturer on Gynæcology at King's College Hospital Medical School, and Obstetric Physician to King's College Hospital.

RIDGE, P. B., M.B., B.Ch. R.U.I., has been appointed Lecturer on Morbid Anatomy and Histology and Curator of the Museum at King's College Hospital Medical School.

ROSS, Sir RONALD, K.C.B., F.R.S., has been appointed Physician for Tropical Diseases at King's College Hospital.

SALMOND, R. W. A., M.D., M.Ch. Aberd., D.P.H., has been appointed Assistant Radiographer at King's College Hospital.

SHORE, G. W., M.R.C.S., L.R.C.P. Lond., has been appointed Sambrooke Medical Registrar at King's College Hospital.

SILK, J. F. W., M.D. Lond., has been appointed Lecturer and Instructor in Anæsthetics at King's College Hospital Medical School.

TUNNICLIFFE, F. W., M.D. Lond., M.R.C.P. Lond., has been appointed Lecturer on Practical Medicine and Lecturer on Therapeutics and Applied Pharmacology at King's College Hospital Medical School.

WILTSHIRE, H. W., M.D. Lond., M.R.C.P. Lond., has been appointed Lecturer on Practical Medicine at King's College Hospital Medical School.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

ABERGAVENNY, MONMOUTHSHIRE ASYLUM.—Second Assistant Medical Officer. Salary £225 per annum, with board, apartments, washing, and attendance.

BANBURY, HORTON INFIRMARY.—House Surgeon. Salary £100 per annum, with board and residence.

BEDFORD COUNTY HOSPITAL.—Assistant House Surgeon. Salary £80 per annum, with board, lodging, and laundry.

BERKSHIRE EDUCATION COMMITTEE.—Assistant Medical Inspector of Schools. Salary £300 per annum.

BIRKENHEAD UNION INFIRMARY AND WORKHOUSE.—Senior Resident Assistant Medical Officer. Salary £150 per annum, with board, apartments, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL.—Third House Surgeon. Salary £80 per annum, with residence and board.

BIRMINGHAM GENERAL DISPENSARY.—Resident Medical Officer, unmarried. Salary £220 per annum, with apartments, fire, light, and attendance.

BIRMINGHAM, UNIVERSITY OF.—Lecturer on Pathology and Bacteriology in University and Visiting Pathologist to General Hospital.

BRADFORD CHILDREN'S HOSPITAL.—House Surgeon. Salary £100 per annum.

BRADFORD ROYAL INFIRMARY.—House Physician, unmarried. Salary £100 per annum, with board, residence, and washing. Also House Surgeon, unmarried. Salary £100 per annum, with board, residence, and washing.

BRIDGWATER HOSPITAL.—House Surgeon. Salary at rate of £125 per annum, with board, lodging, and washing.

BRISTOL ROYAL INFIRMARY.—House Physician. Salary at rate of £100 per annum, with apartments, board, and laundry.

BURY ST. EDMUNDS, WEST SUFFOLK GENERAL HOSPITAL.—Resident Medical Officer, unmarried. Salary £120 per annum, with board, lodging, and laundry.

CAMBRIDGE, ADDENBROOKE'S HOSPITAL.—House Surgeon for six months. Salary at rate of £100 per annum, with board, residence, and laundry.

CANCER HOSPITAL, Fulham-road, S.W.—House Surgeon for six months. Salary £70 per annum.

CANTERBURY MENTAL HOSPITAL, Canterbury.—Assistant Medical Officer, unmarried. Salary £160 per annum, with board, lodging, washing, and attendance.

CARDIFF, KING EDWARD VII.'S HOSPITAL.—House Surgeon for six months. Salary at rate of £60 per annum, with board, residence, and laundry.

CHESTER GENERAL INFIRMARY.—House Physician. Salary £90 per annum, with residence and maintenance.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—House Physician. Salary £90 per annum, with board, apartments, and laundry.

COLCHESTER, ESSEX COUNTY HOSPITAL.—House Physician. Salary £80 per annum, with board, residence, and washing.

COVENTRY AND WARWICKSHIRE HOSPITAL, Coventry.—Senior House Surgeon, House Physician, and Junior House Surgeon. Salary of former £150 per annum, and of two latter £110 and £100 per annum respectively, with residence, board, laundry, and attendance.

DEVONPORT, ROYAL ALBERT HOSPITAL.—Assistant House Surgeon, unmarried. Salary at rate of £75 per annum, with board and laundry.

DORSET COUNTY COUNCIL.—Two Assistant County Medical Officers. Salary at rate of £250 per annum.

DORCHESTER, DORSET COUNTY HOSPITAL.—House Surgeon, unmarried. Salary £100 per annum, with board and residence.

DURHAM COUNTY COUNCIL.—Assistant Tuberculosis Medical Officer. Salary £300 per annum.

DURHAM COUNTY SANATORIUM.—Medical Superintendent. Salary £400 per annum, with quarters and board.

EXMINSTER, DEVON COUNTY ASYLUM.—Junior Assistant Medical Officer. Salary £200 per annum, with quarters, board, and laundry.

GATESHEAD DISPENSARY.—Assistant Medical Officer. Salary £200 per annum.

GLOUCESTERSHIRE COUNTY COUNCIL AND GLOUCESTER CORPORATION JOINT COMMITTEE.—Tuberculosis Medical Officer. Salary £500 per annum.

GRIMSBY AND DISTRICT HOSPITAL.—Senior House Surgeon. Salary £100 per annum. Also Junior House Surgeon. Salary £80 per annum, with board, lodging, attendance, and washing.

HALIFAX ROYAL INFIRMARY.—Second House Surgeon, unmarried. Salary £100 per annum, with residence, board, and washing.

HAMMERSMITH INFIRMARY AND WORKHOUSE, Ducane-road, Wormwood Scrubs, W.—Assistant Medical Officer. Salary £110 per annum, with board, lodging, &c.

HASTINGS, EAST SUSSEX HOSPITAL.—Assistant House Surgeon. Salary at rate of £70 per annum, with residence, board, and washing.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.—House Surgeon, unmarried, for six months. Salary £30, with board and residence.

INDIA, IMPERIAL BACTERIOLOGICAL (VETERINARY) LABORATORY, Muktesar.—Assistant Bacteriologist. Also Pathologist. Salary will not be less than £480 per annum.

KENSINGTON WORKHOUSE AND INFIRMARY.—Second Assistant Resident Medical Officer. Salary £110 per annum, with apartments, board, and washing.

LANARK, COUNTY OF.—DISTRICT OF THE LOWER WARD: Tuberculosis Officer and Assistant Medical Officer of Health. Salary £300 per annum. DISTRICT OF THE MIDDLE WARD: Tuberculosis Officers and Assistant Medical Officers of Health (two). Salary £300 per annum.

LEEDS GENERAL INFIRMARY.—Resident Ophthalmic House Surgeon. Salary £50 per annum, with board, residence, and laundry.

LEICESTER POOR-LAW INFIRMARY.—Second Resident Assistant Medical Officer. Salary £150 per annum, with rations, apartments, and washing.

LIVERPOOL, ROYAL SOUTHERN HOSPITAL.—Two House Physicians and Three House Surgeons for six months. Salary at rate of £60 per annum, with board and residence.

LIVERPOOL STANLEY HOSPITAL.—House Surgeon. Salary £75 per annum, with board, residence, and laundry.

MAIDSTONE, KENT COUNTY ASYLUM.—Fourth Assistant Medical Officer, unmarried. Salary £200 per annum, with quarters, attendance, washing, &c.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury.—Resident Officer, unmarried, for six months. Salary at rate of £100 per annum.

MANCHESTER EDUCATION COMMITTEE.—Assistant School Medical Officer. Salary £250 per annum.

MANCHESTER, MONSALL FEVER HOSPITAL.—Third Medical Assistant. Salary £100 per annum, with board, lodging, and washing.

MANCHESTER ROYAL EYE HOSPITAL.—Junior House Surgeon. Salary £80 per annum, with residence, board, and washing.

MANCHESTER ROYAL INFIRMARY.—Medical Officer for six months. Salary at rate of £100 per annum, with board and residence.

MANCHESTER WORKHOUSE, Crumpsall.—Junior Resident Assistant Medical Officer, unmarried. Salary £110 per annum, with rations, apartments, washing, attendance, &c.

MIDDLESBROUGH, NORTH RIDING INFIRMARY.—Senior House Surgeon. Salary at rate of £100 per annum for first six months and £120 per annum for second six months, with board, residence, and laundry.
MILLER GENERAL HOSPITAL FOR SOUTH-EAST LONDON, Greenwich-road, S.E.—Junior House Surgeon for six months. Salary at rate of £85 per annum, with board, residence, and laundry.
NEWCASTLE-UPON-TYNE DISPENSARY.—Visiting Medical Assistants. Salary £200 per annum.
NEWCASTLE-ON-TYNE HOSPITAL FOR SICK CHILDREN.—Junior Medical Officer. Salary £80 per annum, with board, lodging, and laundry.
NEWCASTLE-UPON-TYNE WORKHOUSE AND HOSPITAL.—Second Assistant Resident Medical Officer (female), unmarried. Salary at rate of £100 per annum, with apartments, rations, and washing.
NEWPORT (MON.), ROYAL GWENT HOSPITAL.—Resident Medical Officer. Salary at rate of £100 per annum, with board, residence, and laundry.
NOTTS COUNTY COUNCIL.—Tuberculosis Officer. Salary £400 per annum.
OXFORD COUNTY ASYLUM, Littlemore, near Oxford.—Assistant Medical Officer. Salary £150 per annum, with apartments, board, and washing.
PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Physican for six months. Salary £75 per annum, with board, residence, and washing.
PRESTON, COUNTY ASYLUM, Whittingham, Lancs.—Assistant Medical Officer, unmarried. Salary £200 per annum, with board, apartments, and washing.
QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—Assistant Resident Medical Officer for four months. Salary at rate of £50 per annum, with board, residence, and washing.
RAINHILL, NEAR LIVERPOOL, COUNTY ASYLUM.—Assistant Medical Officer, unmarried. Salary £200 per annum, with apartments, board, attendance, &c.
READING, ROYAL BERKSHIRE HOSPITAL.—Second House Surgeon. Salary at rate of £80 per annum, with lodging, board, and washing.
RICHMOND, SURREY, ROYAL HOSPITAL.—Assistant House Surgeon. Salary £70 per annum, with board and apartments.
ROYAL NAVAL MEDICAL SERVICE.—Twenty-five appointments.
RYDE, ROYAL ISLE OF WIGHT COUNTY HOSPITAL.—Resident House Surgeon, unmarried. Salary £125 per annum.
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WORCESTERSHIRE COUNTY COUNCIL.—Assistant School Medical Officer. Salary £250 per annum.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Aberfeldy, in the county of Perth; at Boston, in the county of Lincoln; at Glenavy, in the county of Antrim; and at Pewsey, in the county of Wilts.

Births, Marriages, and Deaths.

BIRTHS.

UNWIN.—On August 4th, at Penn Hill, Yeovil, the wife of Harold R. Unwin, F.R.C.S. Eng., of a son.

MARRIAGES.

GEIKIE COBB—DE POIX.—On Tuesday, August 12th, at St. Edmund's, Bungay, Ivo Geikie Cobb, M.D., to Audrey, only daughter of Edmond Tyrel de Poix, J.P., and Mrs. de Poix, of Broome Place, Norfolk.
MACNISH—WILSON.—On August 11th, at All Souls, Langham-place, W., by the Rev. W. F. Scott, David MacNish, M.A., M.B., of Harley-street, W., to Margaret, widow of Herbert W. Wilson, of Liverpool.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

STUDENTS' NUMBER OF THE LANCET.

INFORMATION intended for the Students' Number of THE LANCET must be sent WITHOUT DELAY, addressed to the Sub-Editor, and marked on the envelope "Students' Number Only."

THE TREATMENT OF RINGWORM OF THE SCALP BY DRUGS.

To the Editor of THE LANCET.

SIR,—The rapid cures of ringworm of the scalp, said to have been effected by means of drugs, reported from time to time in various medical journals, led me to make a careful trial of such methods, but so far my results have been far from encouraging. The following treatment was employed in connexion with about 50 cases of ringworm, as well as a few cases of favus. Before starting the treatment the head in each case was shaved and thoroughly cleansed. The drugs used were various preparations of iodine, mercury, soda, and carbolic acid; also acetic acid, turpentine, methylated spirit, and cyllin soft soap. They were used in various strengths and combinations, according to the effect on the scalp, some being very sensitive to certain drugs. The children attended the school clinic on an average of three times a week, when the various drugs were applied in a thorough manner by the school nurse, the head afterwards being covered by grease-proof paper, and the hair being kept short by shaving from time to time. In several cases the mothers carried on the treatment at home in a very thorough and painstaking manner, including epilation in some cases. In the majority of the cases the result of the first few applications was to remove all signs of scurf and give the diseased area a clean and healthy appearance, but on careful examination with a lens the characteristic "stubble-like" hairs could be seen, and on epilation the spores were plainly visible with the microscope; this condition remained in the great majority of cases for months, notwithstanding the treatment was continued with regularity and vigour. Moreover, if for any reason the treatment was discontinued for a short time, the diseased areas soon showed all the signs of typical ringworm.

From the above experience the treatment of ringworm of the scalp by drugs only appears to me to be useful in limiting the spread of the disease in the patient's scalp, and preventing it from being a source of infection to other children, but certainly did not bring about a cure.

In two cases of debilitated and neglected-looking children the first result of the treatment was to cause the disease to spread rapidly over the scalp, and in one case over the body, in a most alarming fashion, but the condition rapidly improved with the administration of tonics, cod liver oil, &c., combined with local treatment.

I am, Sir, yours faithfully,

Hastings, August 5th, 1913. O. POLHILL TURNER, D.P.H. Oxon.

PRIZES AT THE SEVENTEENTH INTERNATIONAL CONGRESS OF MEDICINE.

Messrs. Burroughs, Wellcome, and Co. have the distinction, in connexion with their exhibit at the International Congress of Medicine, of obtaining in two of the sections the highest possible award from the International Jury. The prizes referred to are for products exhibited in Section No. 2, which includes pharmaceutical preparations, fine chemicals, and antiseptics; and in Section No. 5, which relates to serum-therapy, organotherapy, and bacteriology.—Messrs. John Ward, Limited, were awarded a gold medal for their display of invalid chairs, couches, and other specialities.—The Dongor Hygienic Company have been awarded a diploma and a silver medal.

FACTORY GIRLS' COUNTRY HOLIDAY FUND.

To the Editor of THE LANCET.

SIR,—Unless this Fund receives additional help we shall have to disappoint a large number, and the disappointment will occasion many tears. We ask that all who value their own holidays will help to avert this disappointment to those who so greatly need the benefit. The girls do their utmost towards the cost of their holiday, but they are too poor to have it without the help of such a Fund as this. We ask earnestly for contributions to be sent to the Chairman of the Executive Committee, the Rev. Edward Canney, St. Peter's Rectory, Saffron Hill, London, E.C., or to the London County and Westminster Bank, Holborn Circus Branch, E.C.

We are, Sir, yours obediently,

E. GARRETT ANDERSON, M.D. — ROBERT F. HORTON.
BEATRICE B. TEMPLE. — FRANK LLOYD.
NORFOLK. — H. L. STEPNEY.
J. H. HERTZ (Chief Rabbi). — HUBERT M. SOUTHWARK.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—10 A.M., Dr. Simson: Diseases of Women. 10.30 A.M., Medical Registrar: Demonstration of Cases in Wards. 12 noon, Dr. Bernstein: Pathological Demonstration. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Armour: Operations. Mr. Dunn: Diseases of the Eye. 5 P.M., Lecture:—Mr. B. Harman: The Detection and Significance of Optic Neuritis.

TUESDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 10.30 A.M., Surgical Registrar: Demonstration of Cases in Wards. 12 noon, Mr. T. Gray: Demonstration of Fractures. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin. 5 P.M., Lecture:—Dr. Davis: Eustachian Obstruction, its Results and Treatment.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. 12 noon, Mr. Souttar: Abdominal Diagnosis. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women. 5 P.M., Lecture:—Mr. Bernstein: The Blood in Diagnosis.

THURSDAY.—10.30 A.M., Dr. Simson: Gynæcological Demonstration. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Armour: Operations. Mr. Dunn: Diseases of the Eye. 5 P.M., Lecture:—Dr. Bernstein: The Blood in Diagnosis.

FRIDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 12.15 P.M., Dr. Bernstein: Clinical Pathology, Chemo-therapy. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin. 5 P.M., Lecture:—Dr. Bernstein: The Blood in Diagnosis.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Diseases of the Eye. 12 noon, Mr. Souttar: Surgical Anatomy of the Abdomen. 2 P.M., Medical and Surgical Clinics. Mr. Pardoe: Operations.

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.

THURSDAY.—5.15 P.M., Clinical Lecture.

ROTUNDA HOSPITAL POST-GRADUATE COURSES, Dublin.

MONDAY.—10 A.M., Obstetrical Lecture. 11 A.M., Examination of Patients and Minor Operations.

TUESDAY.—10 A.M., Major Operations. 4 P.M., Class in Gynæcological Diagnosis.

WEDNESDAY.—10 A.M., Obstetrical Lecture. 11 A.M., Examination of Patients and Minor Operations.

THURSDAY.—10 A.M., Major Operations.

FRIDAY.—10 A.M., Gynæcological Lecture. 11 A.M., Examination of Patients and Minor Operations. 4 P.M., Class in Gynæcological Diagnosis.

For further particulars of the above Lectures, &c., see Advertisement Pages.

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IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial Staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index and Title-page to Vol. I. of 1913, which was completed with the issue of June 28th, were given in THE LANCET of July 5th.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1913 are now ready. Bound in cloth, gilt lettered, price 16*s.* carriage extra.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Aug. 13th, 1913.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Aug. 7	30·08	S.W.	...	105	68	54	53	58	Cloudy
,, 8	29·96	S.W.	0·10	107	68	54	55	57	Cloudy
,, 9	29·82	S.W.	...	98	65	54	54	56	Overcast
,, 10	29·91	W.	...	117	69	53	55	59	Cloudy
,, 11	29·94	S.W.	0·06	111	72	53	58	60	Overcast
,, 12	30·07	N.	...	105	68	57	60	61	Overcast
,, 13	30·15	W.	...	111	69	59	57	60	Cloudy

The following journals, magazines, &c., have been received:—Kurscisto, Medical Review, Dublin Journal of Medical Science, International Journal of Surgery, Clinique Ophthalmologique, American Journal of Medical Sciences, Monthly Encyclopædia, Pediatrics, Archives of Pediatrics, Il Policlinico, Indian Medical Journal, Annali di Medicina Navale e Coloniale, British Journal of Children's Diseases, St. George's Hospital Gazette, Journal of Mental Science, Ophthalmology, Bulletin of the Johns Hopkins Hospital, St. Paul Medical Journal.

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